Trains

FEBRUARY

25¢

See page 11.

H. W. Pontin; Railroad Photographs, 47 Royal St., Allston, Mass.

A Berkshire locomotive in the Berkshire Hills.

Pounding eastward with symbol freight XB-2, Berkshire type locomotive No. 1441 of the Boston & Albany emerges from State Line Tunnel, about 40 miles east of Albany on the climb to the summit of the Berkshire Hills. The 2-8-4 type of locomotive was named for this stretch of the B&A. Scenicly it is a beautiful bit of railroad, one which combines rugged and rocky grandeur with the delicacy and greenness of New England. And don't let the title Berkshire Hills fool you. This is really mountain railroading, with tenuous curves following rushing streams, and with grades as steep as 90 feet to the mile. State Line is the only tunnel on the Boston & Albany, and is carved through solid granite. The B&A is part of the New York Central System, bringing traffic into New England from the western reaches of the NYC. As the name implies, the main stem is the 200-mile Boston-to-Albany trackage, over which some 18 through passenger trains are scheduled, with the Chicago-Boston *New England States* as flag bearer.

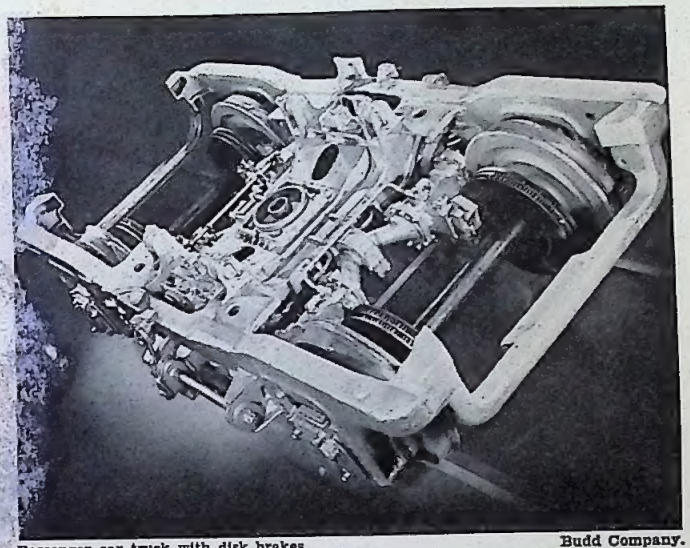
Waybills

We've all come in contact with the man who continues to date his letters "1941" well into the new year . . . but editors are supposed to know better! Notwithstanding, the January TRAINS bore last year's date, and amid profuse apologies we suggest that you mark "1942" on your copy now, so that it won't cause confusion later.

Wartime censorship prevented the Koppers Company from giving us the location of the excellent Kodachrome shot we used as a frontispiece in the January TRAINS. We guessed the correct location (athough we couldn't mention it, of course), but we thought the camera was facing west. It was facing east and the picture is "Dawn over the Long Island Railroad" instead of sunset! During the rush hours, ——— is one of the busiest spots on any railroad in America and we hope, after the war, we can say more about it.

The postoffice *does not* forward magazines even if you leave a forwarding address, unless you also leave money to prepay the exact forwarding postage on specific magazines. If you move the *only* way to be sure of not missing copies of TRAINS is to notify us three weeks in advance, giving old as well as new address. We are not responsible for copies missed when we have not been notified in ample time. Postoffice forwarding applies only to first-class mail, and please *do not* assume that giving the new address to the postman is sufficient in case of magazines.

A. C. K.



Passenger car truck with disk brakes. Budd Company.

Trains

Editors: A. C. Kalmbach, Linn H. Westcott, Willard V. Anderson

Vol. 2 February, 1942 No. 4

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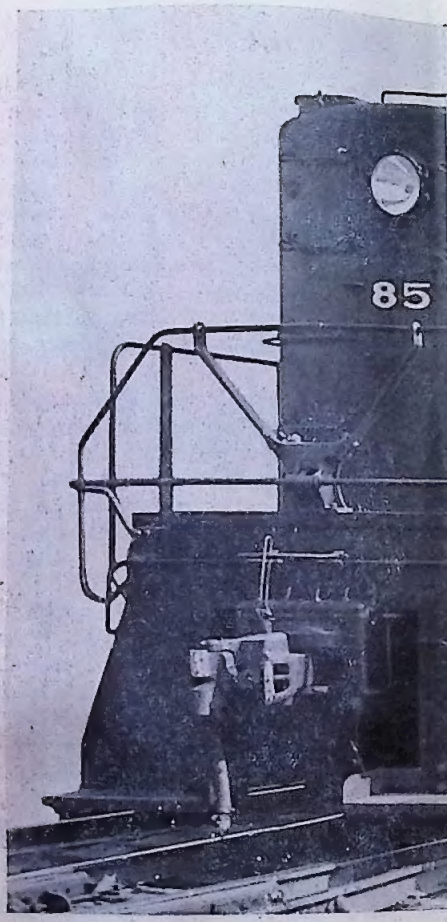
Switch Engines

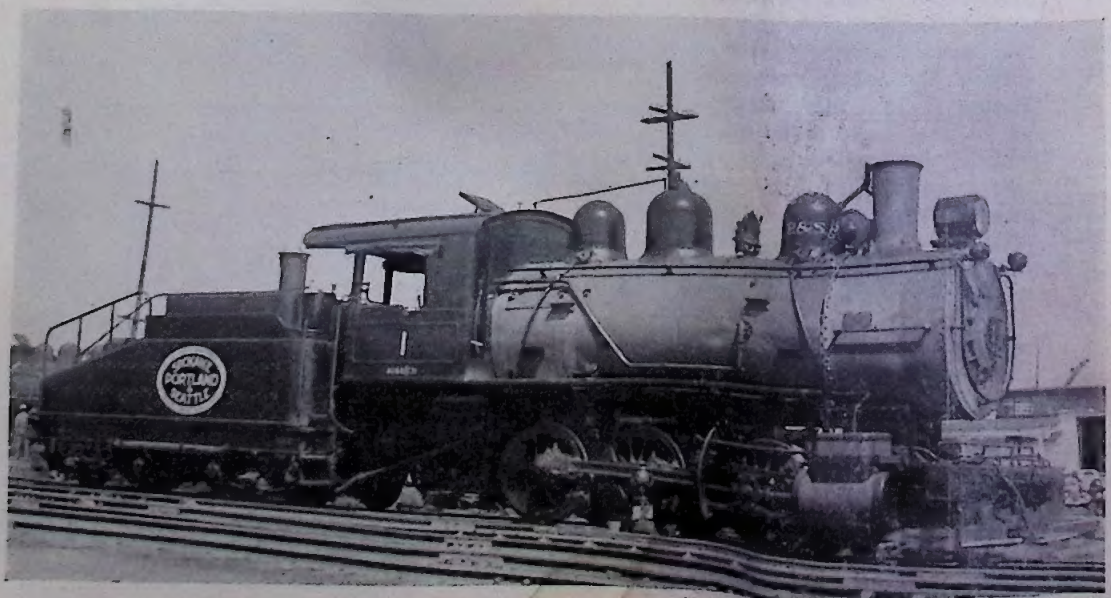


THE economy of railroad transportation lies in the fact that a hundred railroad cars to different destinations can be switched together into one train and handled en mass as a quantity job. The railroad was the first large scale example of American mass production economy, an idea later developed in the automobile, home appliance, and other manufacturing industries. And the great classification yards are the railroad's assembly lines!

The average freight car, running from loading platform to receiving platform, spends more than half its time behind switch engines. And while road freight engines put in 543 million miles during 1940 and passenger road engines 360 million miles, switch engines turned in the surprising total of 236 million miles—not counting the 47 million miles switched by the engines of trains themselves.

Most new switchers are Diesel-powered.

The characteristics of the Diesel-electric locomotive especially fit it for switching, and it has been accepted in this catagory with far more unanimity than in road service, although the existing steam switchers are turning in good accounts on many jobs where 24-hour-a-day availability is not needed. The NYC job was built by Alco-General Electric. The Spokane, Portland & Seattle 1-spot is a typical Alco 0-6-0



R. W. Biermann, 4338 20th St., San Francisco, Calif.

★ Important little drudge, the switcher, for it eats up half of freight train time and does 236 million miles a year.

General Electric Co.

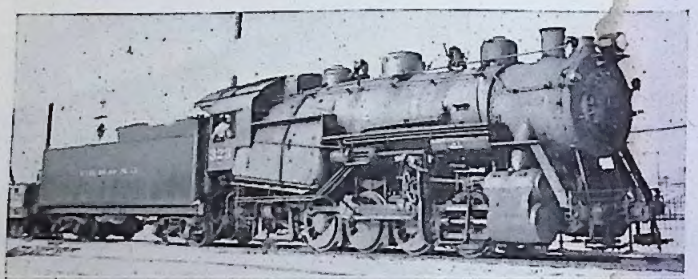
switcher, 31,200 pounds tractive effort, built in 1907. The Boston & Maine eight-wheel switcher No. 630 is also an Alco job, built in 1922, and is a bruiser of a locomotive with 50,050 pounds tractive effort.

Robert A. Le Massena, 398 N. Maple Ave., East Orange, N. J.

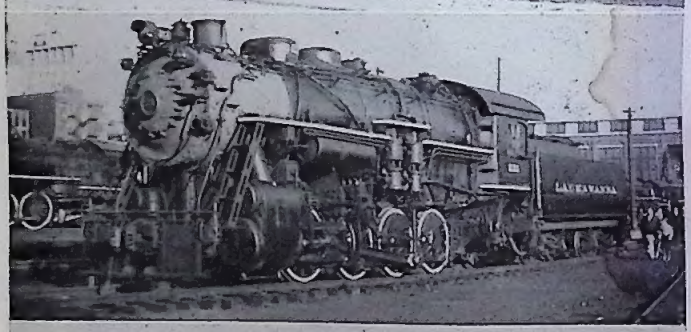
Donald A. Somerville, Monterey Apts., 43rd and Chester, West Philadelphia, Pa.

More switchers.

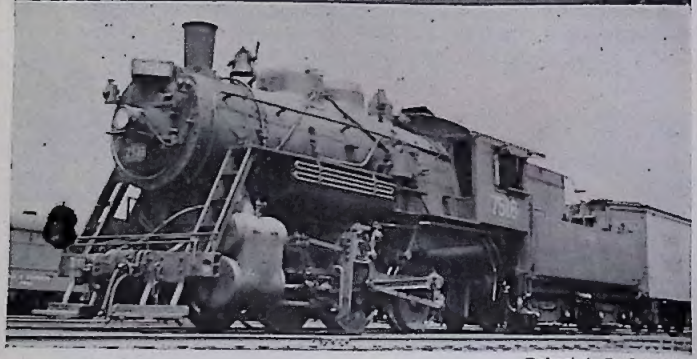
When New York Central electrified its Grand Central Terminal in 1906 it bought its first electric road locomotives. These were some of the earliest high-speed heavy electric locomotives built, and there wasn't much precedent to go by. The motor armatures were right on the driving axles, and could move up and down between the two



Baldwin built these 0-8-0's for the Central of New Jersey in 1930. They're hefty, used for handling mile-long drags in transfer trains between yards and docks, or for switching long cuts of cars in terminal yards.



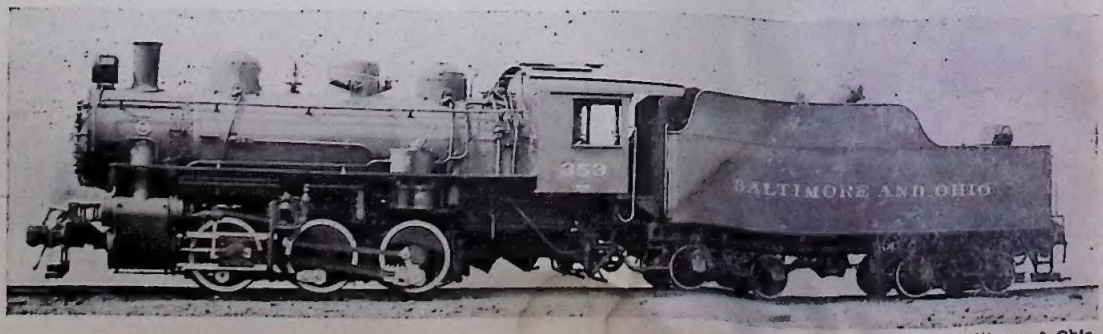
During the long, lean years from 1929 to 1936 the Scranton Shops of the Lackawanna didn't lie idle, but spent their time rebuilding obsolete 4-6-2's and 2-8-2's into heavy 0-8-0 switchers. Like the 214, all 60 of these rebuilds have huge boilers and fire boxes.



The 7518 is a quite modern 0-6-0 switcher, built for Canadian National by the Canadian Locomotive Works in 1923. Sometimes she handles a cut of 20 heavy passenger cars for the *Maritime Express* or the *Ocean Limited.* She's shown here in the yards of Bonaventure Station, Montreal.

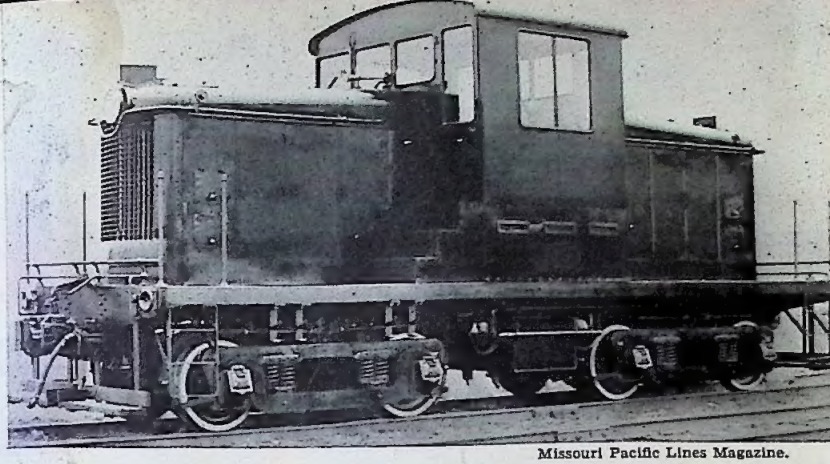
Robert A. Le Massena.

No. 353 is one of 301 standardized 0-6-0 switchers built for the United States Railroad Administration by American and Baldwin and assigned to various railroads during World War I. The B&O got 40, of which 20, including the 353, were built by Baldwin, and 20 by Alco.



Baltimore & Ohio.

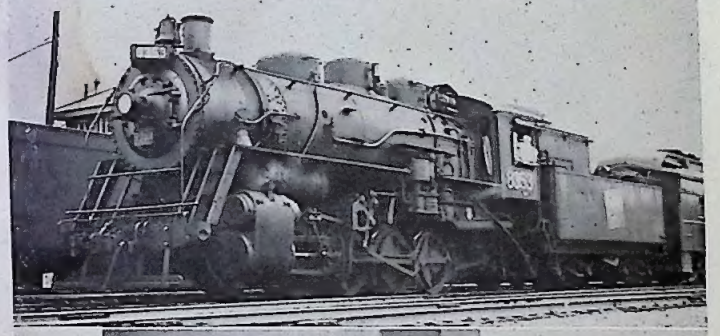
pole pieces. The low center of gravity was hard on track, and the locomotives were later rebuilt with four-wheel pilot trucks instead of two-wheel. Now many of them do switching service; a few work suburban trains. On the other end of the electric switcher scale are the 44-ton, 360-horsepower Diesel-electric baby switchers (right) of the Missouri Pacific, capable of handling 30 to 35 cars on level track.



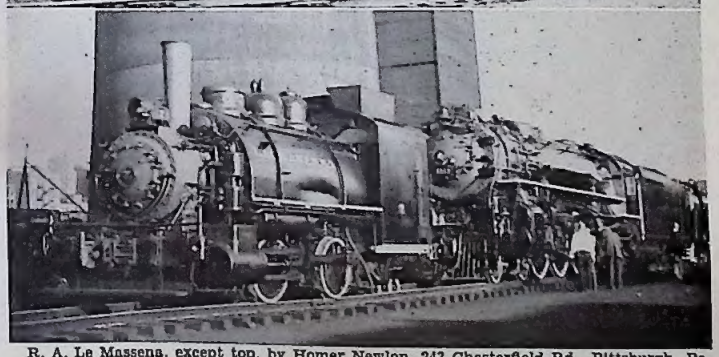
Missouri Pacific Lines Magazine.

Only the tiny initials at the top edge of the tender tank identify the 9159 as belonging to the Pittsburgh, McKeesport & Youghiogheny, part of the New York Central System running southeast of Pittsburgh to Connellsville.

Most Canadian locomotives are built in Canada. The 8353, heavy 0-8-0 switcher of the Canadian National, was built by the Canadian Locomotive Works and spends most of her time switching cars in the yards of Bonaventure Station, CN's main Montreal station.

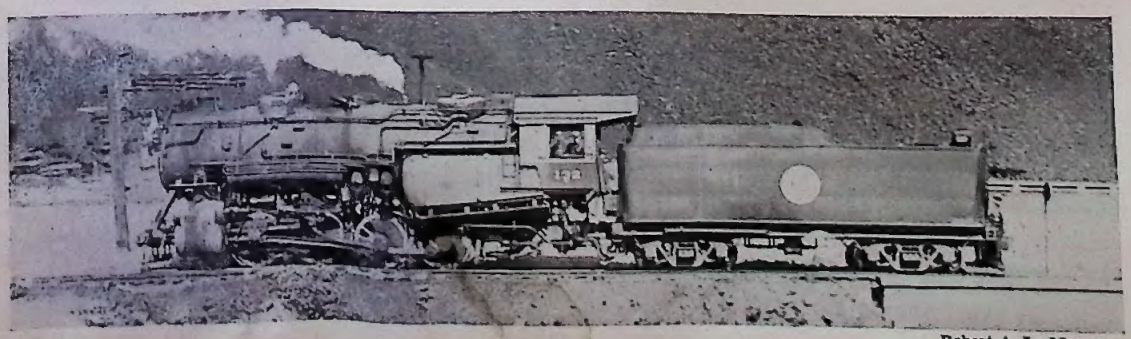


On the bottom rung of the switcher ladder are the little 0-4-0's, usually tank engines used for shop and roundhouse service. They are small enough to get right onto a turntable with many a bigger locomotive. This one is on the Lackawanna and works at the Scranton Shops.



Lehigh & New England has only three of these big 0-8-0's, and they're hard to find. The 132 was snapped at Tamaqua, Pa., as she waited for a railfan special to get out of the way. Baldwin was the builder, and the weight on drivers is 269,800 pounds; tractive effort, 68,500 pounds.

R. A. Le Massena, except top, by Homer Newlon, 243 Chesterfield Rd., Pittsburgh, Pa.



Robert A. Le Massena.

Ophir, Colo.

"And they brought gold from Ophir, brought in from Ophir great plenty of almug tree, and precious stones."

—*Kings 1, Chap. 10, Verse 11.*

"Ophir is the most picturesque of towns—a small town, a toy town it seems; it clings to the steep mountainside above the 9000-foot mark and the peaks tower above on every side, almost closing it in. I must be a sentimental person, for that tiny town, the towering mountains, and the mere sound of the words, 'The Gold of Ophir and a narrow gauge railway,' bring tears to my heart.

"The railroad station there stands small but strong as a small Gibraltar, and far above it is the mine. From this mine to the station stretches an aerial tram which carries the ore down and dumps it into the waiting box cars. Late in the afternoon I saw a train, loaded with ore, on the narrow gauge. So heavy was it and so steep the grade that two locomotives puffed and struggled as the train crept along.

"I've ridden on the streamliners, listening to the radio, drinking a glass of beer, watching the countryside whisk by and arriving at my destination with unbelievable swiftness; but all this modern equipment is accepted as a matter of course and never brings to me the same thrill as the narrow gauge, a page out of the past."

—*Jean Lee.*

Silver San Juan Scenic Line

★ **Rio Grande Southern winds 162 miles between terminal towns barely 60 miles apart.**

By William Moedinger Jr.

TWO HUNDRED miles due southwest of modern, cosmopolitan Denver lies an area so vividly reminiscent of the lustily-ornate boom days of the late nineteenth century that even the tourist or stranger, accustomed to trains and travel in the 1942 manner, views its quaint narrow gauge railroads not as antiquated modes of transportation but as essentials to the vast, unfolding panorama. Here, within rather indefinable boundaries embracing some 4000 square miles, is Colorado's Silver San Juan, penetrated and traversed by the tracks and trains of three narrow gauge railroads snaking their ways through the deeply-eroded valleys and atop granite shelves blasted from the faces of precipitous walls. Here is the railroad of our story, the Rio Grande Southern, together with the Silverton and Ouray branches of the large D&RGW system and the remaining nine miles of the little Silverton Northern.

Fifty years ago the first day of this month, the rugged defiles of the San Juan echoed for the first time with the sounds of this newly-completed railroad, displacing long, winding trains of plodding burros and forming a tiny but important link in a hitherto-disjoined section of a rapidly-maturing three-foot-gauge empire. In its prime, Rio Grande Southern flaunted a picturesque herald decrying it as the "Silver San Juan Scenic Line," but this and the steam passenger train have disappeared with a once-lucrative passenger traffic, and in their places have come the almost-heretical passenger railcar and the much less flattering nickname, *"Galloping Goose* Line." In spite of these and the accusations of a few who would have us believe the

Farm Security Administration photo by Russell W. Lee, 1414 Ramsey St., Dallas, Tex.

railroad is one of those that have outlived their usefulness, Rio Grande Southern, by sheer inclination to carry on while others have become fond recollections, has risen from a rather insignificant position among dozens of others to the rank of second largest of the narrow gauges remaining in our United States today, and determinedly provides transportation facilities to a region where poor roads prevail—a region from which subsidized highway carriers shy lest the inevitably-high operating costs seriously impair their profits skimmed from more lucrative areas.

Backbone of Rio Grande Southern's 198 miles of track is a 162-mile main line meandering between terminal towns barely 60 miles apart as the crow flies, and over which, daily, three of the six home-made gasoline railcars jostle to provide 29 way stations with passenger, mail, express, and l. c. l. freight service and to account for one-third of the country's narrow gauge passenger train mileage. The Telluride Branch, for the past two years operated for freight service only, reaches eastward from Vance Junction on the main line, through Telluride, second largest town served by the line, to Pandora, and accounts for the remaining 10 route miles and four additional way stations. Ridgway, the northern terminal and home of the "Southern's" shops, storage yards, and only roundhouse, is the interchange point with the Ouray Branch of the Denver & Rio Grande Western Railroad's Marshall Pass line. At Durango, the southern terminal, largest town on the line and home of the general offices, connection is made with the Durango-Alamosa line

and the Farmington and Silverton branches of the "Grande." Operating literally in a narrow gauge world free from all traces of the standard gauge, the "Southern" shares both terminal towns with but one other railroad, the three-foot-gauge lines of the "Grande" and, except for the town of Dolores, where the five-mile-long, privately-owned three-foot-gauge railroad of the Montezuma Lumber Company joins, the two end-of-line towns are

Linn H. Westcott.

the only ones served by another railroad. With these terminal ties, Rio Grande Southern is an integral part of a 600-mile circle and, including the various feeder branches and spurs to this circle, is part of an 800-mile narrow gauge network.

The main line serves not only as the north-south link between the western extremes of the "Grande's" Marshall and Cumbres lines, but, with the Telluride Branch, provides the only rail facilities to the 4000-odd square miles in the extreme southwest corner of the Centennial State. It is a varied country of precious ore-laden mountains, valuable timber stands, vast cattle ranges, and stately mesas, including Mesa Verde National Park—but a country, despite its vastness and material wealth, sparsely settled and with few sizable centers of population. Save for Durango and Telluride, whose combined populations approach 8000, and Ridgway and six on-line communities whose populations range from 35 to 700, the 30-odd way stations stand either as isolated, boarded-up vestiges of a better day or as the predominant structures amid a few scattered, lonesome houses or sprawling ranch properties.

Nevertheless, to this barren region, which is nearly the size of our state of Connecticut, Rio Grande Southern sells enough transportation to require the operation of three daily passenger trains and, at present, almost an equal number of weekday freights. In terms of tons and dollars, this is far too many trains, and the average railroad would handle an equal volume of business with less than half this number. In terms of Rio Grande Southern, with a main line beset with obstacles enough to sicken any operating department, it is not too many trains and represents the most efficient operation consistent with the needs and desires of a transportation-buying public.

Shortly after Victor A. Miller assumed his duties as receiver for Rio Grande Southern 12 years ago, he withdrew all regular steam passenger trains, junked some of the worn-out passenger motive power, and converted coaches and baggage-mail-express cars into maintenance-of-way cars. It was an unpleasant task, but with steam passenger trains piling up unbearable annual operating deficits which threatened the railroad's very existence, there remained no alternative. Many would readily have disposed of the problem by tying a lone coach or combine car to the rear of freight trains. Miller, however, was not inclined just to dispose of the matter; he sought a solution that would best serve RGS customers, one that would transform passenger trains from liabilities to assets.

Thus, after nearly 40 years of faithful service, the archetypal, Ten-Wheeler-drawn trio of one wooden baggage-mail-express car and two open-platform coaches gave way to the gasoline-propelled aggregation of locomotive, automobile, and handcar parts which natives dub the *"Galloping Goose"* and employees not too irreverently call the *"Silver Streak."* Although the position of receiver is now ably manned by Cass M. Herrington, the fact that

On the covers.

The brakeman of the Rio Grande Southern freight train on the front cover is not riding the pilot for the scenery or mountain air, but to warn the engineer of rocks on the track around the sharp curves. This particular stretch of iron, from Placerville to Dallas Divide, is the scene of repeated landslides. The Schenectady-built locomotive spent its first 19 years on the Florence & Cripple Creek. Rear cover photo is of an eastbound Northern Pacific freight ascending Bozeman Pass, 6000 feet up in the mountains between Bozeman and Livingston, Mont. A pusher engine is also used on all trains over this pass in either direction.

The long way around.

Otto Mears planned a direct connection between Silverton and Ouray, but because of impossibly steep rock walls he could not complete the last 12 miles. So he built Rio Grande Southern, which for want of those 12 miles of track goes the long way around between Durango and Ridgway to complete the western end of the Colorado narrow gauge circle. A railroad such as the Southern lives on a diet of strictly local business, not through freight, and the roundabout route enables it to serve the San Juan territory well.

Just like Casey Jr.

Like the contortions of some Disneyish animation are the wrigglings of a Rio Grande Southern freight crawling over the corrugations of the San Miguel Mountains. The upper photo is of a middle division train attacking the grades between Ophir and Trout Lake, and the lower photo shows the same train at Trout Lake, a beauty spot nestling beneath the snow-covered peaks of the range. This picture was taken in August, and the snow on the mountainsides in Summer speaks for the road's Winter difficulties.

William Moedinger Jr., 23 E. Vine St., Lancaster, Pa.

RGS today provides the equivalent of one terminal-to-terminal daily passenger run in each direction attests to Miller's keen determination to keep the junk man at a safe distance. To be sure, the *"Galloping Geese"* scarcely symbolize Baldwin's dream of the ultimate in motive-power design, but their economical operation, flexibility, and perfect adaptability to the job for which they were built have converted an expensive headache into the wherewithal for many a new tie or for reconstructing many a foot of main line after Nature has staged one of her tantrums. During the past decade they have become established institutions upon which, directly or indirectly, every on- and off-line resident within these 4000 square miles has learned to rely. Few of these people are as much as occasional riders; only those without their own automobiles make use of the limited passenger facilities. Every one of them, however, is a *"Galloping Goose"* customer, for many of the things he eats, drinks, and wears come via RGS l. c. l. freight or express.

Southwestern Colorado is dotted with numerous C. C. C. camps. One of these, a large one, is located in Mancos. Several times each year Uncle Sam moves these boys from one camp to another, and he calls on RGS to help him. On these occasions, several coaches are rented from the "Grande," and the steam passenger train again is seen in the "Silver San Juan."

When the San Miguel and Dolores rivers haven't been on a rampage that leaves the main line hanging like a suspension bridge above swirling waters, or when the tiny tracks aren't obliterated with tons of mud and rock washed from erosion-scarred mountainsides by the inevitable Summer cloudburst, or when the vulnerable approaches to desolate Lizard Head Pass (elevation 10,240 feet) aren't choked with mid-Winter snow so tightly packed that even the persuasive steam rotary plow falters, Rio Grande Southern's scheduled passenger trains operate something like this: The day begins at 7:30 in the morning, when train No. 372 leaves the Dolores station on her 102-mile, 5-hour-40-minute run to Ridgway [and don't dilly-dally over your breakfast if you find yourself in this friendly little town in the course of riding the

even-numbered *"Galloping Geese,"* because this is the one point where there is no delay on account of a late connection]. At 11:30, provided the bus from Montrose isn't late, a second *"Galloping Goose,"* as train No. 371, departs from Ridgway on her terminal-to-terminal run. If No. 372 has maintained her schedule, the two will meet at 12:34 on Dallas Divide, summit of the Uncompahgres. If the deluxe *San Juan Express*, D&RGW's last remaining straight-passenger steam train from Alamosa, is right on the advertised (and she has an enviable on-time record), a third *"Galloping Goose"* leaves Durango at 4:25 on her 60-mile sprint to Dolores. As RGS train No. 376, she is scheduled for a meet with No. 371 at Mancos and to arrive at 7:32 in Dolores, where she ties up for the night to continue her journey the next morning as No. 372. Passenger operations for the day officially end at 8:23, when No. 371 completes the country's second longest narrow gauge passenger run at Durango.

While it has been refreshing to talk about a small railroad passenger business that is more than self-supporting, Rio Grande Southern revenues from this source are almost insignificantly small, not over a few thousand dollars annually; and they do not or cannot begin to pay the maintenance bills for these 172 miles of mountain railroad. It's the snorting, tugging, heavily-laden weekday freight trains that keep the thousands of feet of timber trestles in repair; that pay fuel costs and crew wages; that operate the rotary and wedge plows during the frozen Winter months; that keep the telegraph lines and property in repair and pay operators. It's carload shipments of ore concentrate from the Rico-Telluride districts; carloads of lumber from the off-line town of McPhee, picked up at Dolores from the interchange tracks with the lumber company's private railroad; inbound shipments of coal received from the "Grande" interchange tracks at both terminals; through shipments of oil from the Farmington (N. Mex.) wells and refineries to points along the "Grande's" Marshall Pass line; and the inbound shipments of general merchandise from far off, merchandise such as automobiles, farm implements, and hardware, that has been transferred from the standard to the narrow at either Alamosa, Montrose, or Salida. It's the seasonal trainload shipments of cattle from Placerville and produce from Dolores, combined with the normal flow of carload tonnage, that pays the wages and salaries of 50 or 60 employees; that maintains the six locomotives and scant hundred pieces of rolling stock; that pays for the rental of additional peak-season motive power, freight cars, and terminal facilities.

And at the same time, only the *"Galloping Geese"* can intimately show you Rio Grande Southern, provide you with a ringside seat as it were, although the freight trains stage the show and add the unforgettable touch of steam and steel to an already-thrilling ride. The struggling, blasting Ten-Wheelers, or wedge-plow-bedecked Consolidations, or the rented "Grande" Mikados, emphasize the rugged country of the "Southern," that makes the 8-hour-53-minute, 162-mile passenger run difficult to maintain.

In spite of a total route mileage insufficient for one average-size division, freight operations are divided into three distinct divisions, each with enough execrable miles of mountain railroad to aptly qualify as any veteran superintendent's pet headache. And it is for

S. H. Fredericks Jr., 55 W. Main St., Lock Haven, Pa.

All-purpose car.
The *"Galloping Goose"* is not exactly an elegant piece of passenger equipment, but it costs only 14 cents a mile to operate, including the operator's wages, gasoline at five miles per gallon, and all repairs. For this pin money six such cars do all the Southern's passenger, mail, express, and l. c. l. business.

this reason that three days are required to move a tank car of gasoline from one end of the line to the other.

Freight trains, of course, are confined to no schedule, operating always as extras and with the current flow and volume of traffic. It is not at all unusual to find three freight trains on the line at once, a freight on each of the three divisions. The southern division, with headquarters in Durango, where motive power is cared for by D&RGW employees and sheltered in the "Grande" roundhouse, extends for 60 miles over the rolling foothills of the La Platas to Dolores. The 65-mile middle division, linking the southern division at Dolores with the northern division at Vance Junction, passively follows the turbulent meanderings of the San Miguel and the Dolores rivers through their narrowing and deepening valleys until the intervening San Miguel Mountains block their paths. Between the two valleys, 24 miles of tortuous, tiny track hurdles the perennially snow-capped San Miguels to make the "Southern's" toughest stretch of iron, the most expensive to maintain. In addition to steep grades and curves, including one 24-degree bend near Trout Lake, and the high wooden trestles at Ophir, which require constant maintenance and repair, Winter snowdrifts and Summer rainy-season landslides continually block the track. At times it seems almost impossible to keep this section of line open.

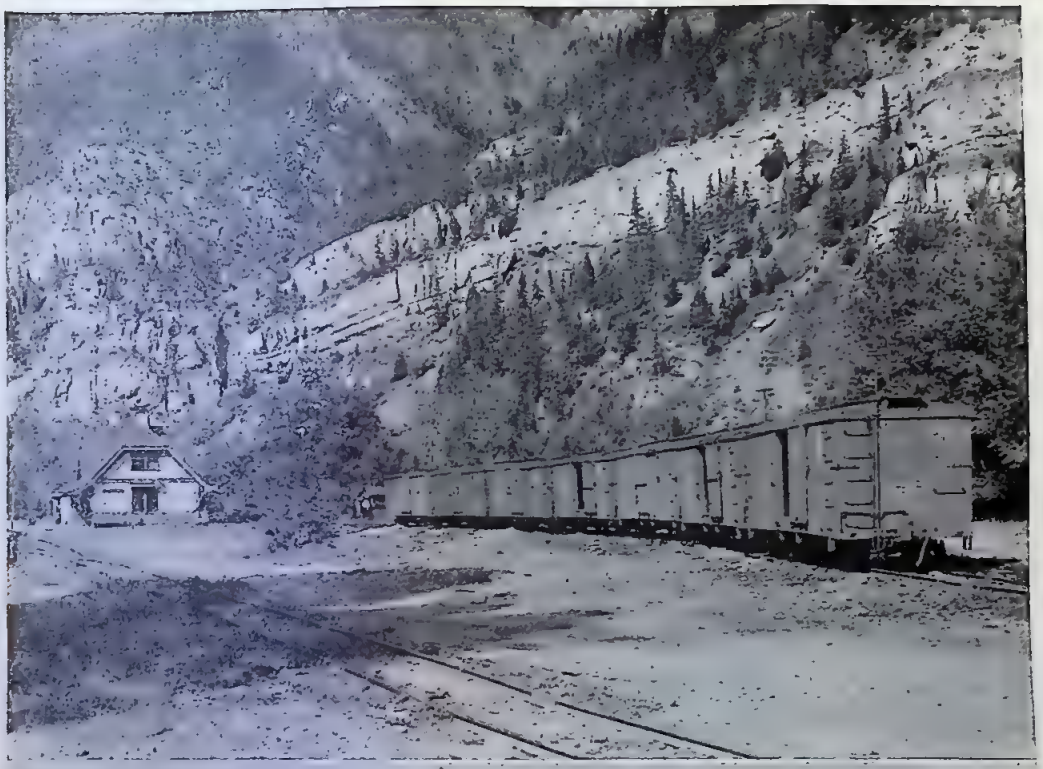
End of the line.

End of line for the Denver & Rio Grande Western branch at the north end of the Rio Grande Southern is Ouray, hemmed in by the high rock walls which Otto Mears found impassable. After Mears surveyed the scene on the opposite page he decided the wisest course was the long way around, the way the Rio Grande Southern goes today. Ouray is almost completely walled in by an amphitheater of precipitous cliff. It is in a natural park, with rock of all colors and a waterfall gushing out high above. The lower picture is Telluride, mining town on the Rio Grande Southern's one branch.

William Moedinger Jr.

Galloping Goose meets landslide.

The *"Galloping Goose"* rounds a curve to meet this sight (upper left), and the operator reports it with his portable telephone set (upper right). Clearing slides is all part of the day's work for operator and passenger, and there may be more farther along. The section crew uses dynamite to clear the larger boulders from the track.



Farm Security Administration photos by Russell W. Lee.

Rico, often called the last outpost of the old West, is the center of operations for this division. In addition to an agency station, it boasts a three-track, double-end, brick enginehouse sheltering those requisites to a stubborn stretch of sky-reaching railroad, a rotary snowplow and a helper engine. Here, too, is a well-groomed and well-preserved piece of equipment belonging to another day, the now rarely used RGS official business car. The northern division includes the 10-mile Telluride Branch and the main line from Vance Junction to Ridgway—the 37 miles that conquer the Uncompahgres on the stiffest grades of the entire railroad, in excess of four per cent on the eastern slope. Division headquarters for these 47 miles are in Ridgway.

When tonnage warrants it, every weekday sees a freight on each of the three divisions, shuttling back and forth on alternate days so that the end division trains coincide at Dolores and Vance Junction when the middle division freight is at these points. Southern and northern division trains are always the heaviest, with double-headers out of Ridgway more or less common. Generally speaking, the middle division is by far the longest and most arduous, but the trains are lighter. Each division

conducts basic freight operations with one of the D&RGW or former D&RGW 450-464 series Mikados. Distributed throughout the system are the three Consolidations and the two Ten-Wheelers which serve as helper engines when extra tonnage requires them, and which handle special passenger movements or in Winter do snowplow duty.

PERHAPS you have wondered why the builders thrust their tracks west from both terminals, unnecessarily across two additional mountains, when they could have stayed on their own side of the fence and joined the present terminals by breasting the summit of only one mountain. The "Southern" represents the route chosen 53 years ago by one of America's foremost mountain railroad builders, but only after he had dreamed of and expended a great deal of time and energy, not to mention funds, on a more direct route.

Early in that Spring of 1889, Otto Mears was relentlessly pushing construction of another railroad which, when completed, would have united the stub ends of the "Grande's" Silverton and Ouray branches and with these would have provided an 83-mile direct rail line between the present terminals of the Rio Grande Southern. He hoped by early Winter to have

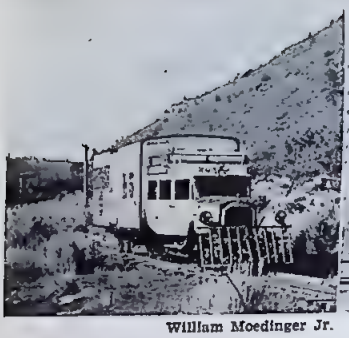
Widest gauge?

Standard railroad gauge in this country is 4'-8½", and we've heard a lot about the various narrow gauges, but there are a few countries where the gauge is wider than 4'-8½". In the United States some interurban and trolley lines use five-foot gauge. What is the widest of all gauges? Was it the seven-foot gauge track, now extinct, of the old Great Western in England?

Two engines, twelve cars.

Hidden back in the smoke at the rear end is No. 41, and it's No. 42 on the front of this Rio Grande Southern extra climbing the westward grade near Durango at about 10 m. p. h. The tank cars represent one of the most prominent classifications of carload freight on the road, oil from the Farmington (N. Mex.) fields moving through to points along the D&RGW's Marshall Pass line.

R. H. Kindig, 3831 Perry St., Denver, Colo.



William Moedinger Jr.

Train No. 372 just out of Dolores shortly after 7:30 a.m. Hardly a photogenic substitute for the steam train, but the *Goose* does the work.

R. H. Kindig.

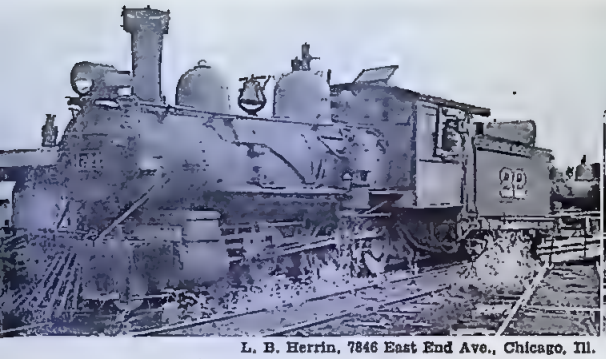
No. 40 has had quite a career. She was born in 1881 as D&RG No. 411 and served as such until 1888. Then she was rebuilt as a standard gauge switcher and carried the number 802. In 1900 she was rebuilt again into a narrow gauge road engine with the number 402.

his 28-mile Silverton Railroad completed. Already track had been laid from Silverton to near the summit of Red Mountain, the highest point between Silverton and Ouray. For some time, Mears had been annoyed at the prospect of laying steel through the narrow confines of Uncompahgre Canyon, which provided a natural pass from near the summit of Red Mountain to Ouray, and he authorized a survey party to chart a new route for these final 12 miles. As progress on his railroad continued, he realized that the extremely steep and narrow canyon route was out of the question, and counted on his survey party to find an alternate route. Perhaps the idea of a Rio Grande Southern occurred to Mears the fateful day he learned that no other potential route existed for these final dozen miles—the crisp June day he stood at rails' end "on top of the world" ironically aware of defeat, aware that

R. H. Kindig.

J. W. Maxwell, 1416 Pennsylvania Ave., Denver, Colo.

Skeletal reminders of days gone by are these abandoned Rio Grande Southern 2-8-0's at rest near Durango in 1938. All were scrapped in 1940. All these were former D&RGW 200 series, renumbered 3, 17, 12, 16, 15, and 10 for the Southern. The caboose is typically neat.



L. B. Herrin, 7846 East End Ave., Chicago, Ill.

No. 22, Ten-Wheeler from Schenectady, amortized her first cost on the Florence & Cripple Creek during the first years of the century and now, past 40 years old, finishes her days on the RGS.

William Moedinger Jr.

Roundhouse and shops of the Rio Grande Southern at its northern terminus, Ridgway, with rented D&RGW Mikado No. 463 steaming up and a couple of *"Galloping Geese"* visible in roundhouse stalls.

his tortuous Silverton Railway could never reach Ouray and bridge the gap in the "Grande's" "Around the Circle" route.

As Otto Mears rode home late that afternoon from the top of Red Mountain over the newly-laid track of his shattered dream, he might have consoled himself honestly with the realization that, if he could not lay those last few miles of track, no one else could; or he might have decided to settle down to a life of luxurious leisure from the returns of his already profitable Silverton Railway. But no, with this rather small, middle-aged man there could be no compromise.

Mears clarified his future intentions to the anxious people of the San Juan when his Rio Grande Southern Railroad was incorporated October 30 of the same year. By the last week in March, 1890, 800 men began the work of grading from Ridgway. By June 700 addi-

Rio Grande Southern motive power (1941).

No.	Type	Driver Dia.	Steam Pressure, Pounds	Cylinders, D. and S.	Tractive Effort, Pounds	Weight, Pounds	Builder	From	Year Built
20	4-6-0	42"	180	16" x 22"	18,650	85,000	Schenectady	F&CC	1899
22	4-6-0	42"	180	16" x 22"	18,650	85,000	Schenectady	F&CC	1900
40	2-8-0	37"	160	16" x 20"	18,947	74,260	Baldwin	D&RGW	1881
41	2-8-0	37"	160	16" x 20"	18,947	74,260	Baldwin	D&RGW	1881
42	2-8-0	37"	145	16" x 20"	17,100	70,300	Baldwin	D&RGW	1887
455	2-8-2	40"	200	17" x 22"	27,000	140,250	Baldwin	D&RGW	1903

Gasoline railcars.

Nos. 3, 4, 5, and 7 are articulated units with three four-wheel trucks.
Nos. 2 and 6 are eight-wheel units.
All units built in the Rio Grande Southern's Ridgway Shops.

Data from the files of R. H. Kindig, 3831 Perry St., Denver, Colo.

During Rio Grande Southern's 50 years, it has never purchased or owned a new locomotive. The original 35 consisted of second-hand 2-8-0's, 2-6-0's, 4-4-0's, and one Shay, most of them from the D&RG RR. The present crop of motive power comes from the D&RGW and the Florence & Cripple Creek. Nos. 20 and 22 were purchased from the F&CC about 1917. Nos. 40, 41, and 42 were purchased from D&RG in 1916. No. 455 was purchased from the same road in 1939.

RGS engine No. 25, retired August, 1940, is the same engine that appeared in the December issue of TRAINS with the Florence & Cripple Creek story. In Mr. McClure's photo it appears as No. 52, but some time after the photo was taken her number was changed to 25.

William Moedinger Jr.

Smoke, steam, and glorious scenery.

With an ex-Denver & Rio Grande Western Mikado as road engine and an ex-Florence & Cripple Creek Ten-Wheeler as helper, a northern division freight bucks the tough grade toward the summit of Dallas Divide just east of Brown, Colo. The timber trestle is typical of Rio Grande Southern. So is the scenery.

tional laborers were at work. Except for a mere handful performing the necessary preliminary work along various sections of the surveyed route, the entire force was grading and laying track from the flourishing little town of Ridgway, soon to be the railroad's northern terminal, to boisterous, booming Telluride, the district's current silver bonanza. By the middle of December, revenue trains were operating into Telluride, and by the end of the month coal trains were running over the five-mile stretch from Coal Banks to Durango at the other end of the line. Embryonic Rio Grande Southern greeted its first New Year as a revenue-producing enterprise.

Construction on the remaining 120-odd miles proceeded by dividing the crews into two competitive gangs working toward each other from Vance Junction and from Franklin Junction, three miles west of Durango. The southern gang's task of laying 55 miles of steel over Cima Pass of the La Plata Mountains in the following 11 months could scarcely be classed as a cinch, but it was an insignificant job compared with building the 70 miles of railroad from Vance Junction to Dolores.

In these 70 miles there were three that defied Otto Mears to build Rio Grande Southern, just as Uncompahgre Canyon had defied him to complete his Silverton Railway. Ophir, they called this place, a half-dozen miles south of Vance Junction, where the valley of the San Miguel ends in a granite-walled cup. While Southern crews, except for an occasional slacking to overcome some minor ob-

stacle or to construct a timber trestle, were laying nearly one mile of track every four days, the men at Ophir were sweating and swearing to lay four miles of steel at the rate of one mile every 40 days. These four miles would carry Rio Grande Southern trains from the floor of the valley, along precipitous, granite walls, to the heights of the cup's rim. Workmen toiled for weeks before any semblance of a railroad right of way could be seen and for nearly six months before they had completed the grand assemblage of long stilt-like wooden trestles, high retaining walls, and granite shelves and cuts which today we awesomely admire as Ophir Loop and recognize as an unmatched feat of engineering skill, comparable with Cumbres, Marshall, and the now train-forsaken Alpine Pass.

On September 6, the first construction train puffed to the top of Ophir Loop. Rio Grande Southern had surmounted the greatest obstacle to its completion. In the following 33 days, crews laid the 21 miles of track from the top of Ophir to Rico—another remarkable feat, for in these miles the railroad not only breasts the summit of the San Miguel Mountains at Lizard Head Pass but crosses some 3800 feet of timber trestles ranging from 12 to 75 feet high. Six days before Christmas of 1891, the two gangs met and drove the final spike.

On the first of February, 1892, as president of the Rio Grande Southern Railroad, Otto Mears, in a brief ceremony, accepted this 172-mile railroad as completed and gave the orders that officially opened it to a transportation-starved people. To commemorate the occasion and to express his gratitude, he gave more than 100 sterling silver passes to close friends and associates. [These unique passes, measuring about 1½" x 2¾" and fully 1/16" thick at the rim, were fashioned by one of the country's leading silversmiths from the Silver San Juan's own product. Raised letters standing in relief from the border of finely-executed filigree spelled the names of the donor's two railroads, Rio Grande Southern and Silverton Railroad. Engraved in the polished center panel and below the solid raised letters spelling "Otto Mears" was the name of the recipient, entitled to free transportation for his life or for that of the railroads.]

BRIEFLY as we must treat the story of Rio Grande Southern during the past half century, it is a tale in four chapters of small engines and short trains everlastingly attacking and conquering the unyielding heights of the Uncompahgres, the San Miguels, and the La Platas.

Chapter One covers a period of 18 months when Rio Grande Southern basked under a bright, new-day sun casting rays of a brilliant future for it. During these few months the San Juan was one teeming mass of humanity seeking to get rich quick by mining the unlimited silver deposits, greatly enhanced by the Silver Purchase Act of 1890. In October of the first year, Mears reported that, before the railroad was a month old, traffic exceeded the capacity of its engines and cars. By late Spring the 29 miles of 30-pound rails between Vance Junction and

The *"Geese"* haul anything and everything.

Lifeline to Rio Grande Southern way stations is the daily, well-filled express and l. c. l. compartments of the *"Galloping Geese."* Packages and mail alike are brought in efficiently and regularly by these economical railcars, without highway subsidy. Station is Rico.

William Moedinger Jr.

Rico began to crack and strain under the heavy and frequent loads, so that, before Fall, the company was forced to replace them with 57-pound rails. He assured the stockholders, however, that while the ever-increasing volume of traffic had required the constant attention of the officials, these additions and betterments had not been made at the expense of Rio Grande Southern's promising future. As evidence of the latter, he advised them that the management aready had three branch lines under consideration. A route had been surveyed from Mancos to the San Juan River, and rails for these 30 miles had been ordered from a Pueblo steel company the previous May. The object in extending the railroad in this direction, he explained, was to ultimately link it with the Atlantic & Pacific Railroad (a forerunner of the Santa Fe) at Prescott Junction, Ariz.

Improvements and additions during the first 17 months of operation jumped the cost of the Rio Grande Southern to nearly $60,000 per mile, but even with the increased financial burden the railroad's 35 locomotives, 18 passenger cars, and 800 freight cars earned the equivalent of more than $1.25 on each of the 45,000-odd shares of stock.

Scarcely had Mears finished reading this stimulating report when the panic, already enveloping the rest of the country in its vise-like grip, thrust itself on the Silver San Juan in the form of demonitization of silver. Rio Grande Southern entered receivership number one.

Chapter Two begins with receivership, August 1, 1893, and ends 28 months later, on December 1, 1895, when the property was returned to the stockholders without foreclosure. It is a chapter full of those intricacies of reorganization which make for dull reading, but during this period Rio Grande Southern came under the wing of the "Grande," and Otto Mears gradually faded out of the picture.

Chapter Three commences here and lasts for 35 years, until the railroad is in the toils of a second receivership. The first 14 years of this period were mildly but consistently prosperous ones; the latter 20 years were characterized by an almost unbroken chain of deficits. The deficit in 1924 alone was almost twice the operating revenues of today. For the period as a whole, business was good, better than it had been in that first boom year; but during the latter half of this period it was the old story: Operating costs soared while revenues plunged.

Rico, division point and mining town.
Center of operations for the rough middle division is Rico, an important shipping center for zinc and lead ores.

Withal, the "Silver San Juan Scenic Line" would gladly return to this period and to so grand a name. These were the days before the private automobile and the superhighway deluded the touring public as to where and how America's grandest scenery could be enjoyed most satisfactorily; the days when this circuitous, single-track railroad was an essential link in the route of an "Around the Circle" all-rail tour considered a "must" by those who had seen or really planned to see America first. More important than the tourist traffic was the substantial volume of local and commercial travelers, for their patronage was less seasonal. In 1907, neither a peak nor a bottom year, there were six daily steam trains that provided the equivalent of one trip each way over the entire main line, two trips each way over the Telluride Branch. In the course of a trip from terminal to terminal, some 70 persons rode for an average distance of 42 miles. In terms of our modern *Daylights* and *Challengers* it may seem paltry, but in terms of Rio Grande Southern it provided sufficient revenue to cover the cost of 353 daily passenger-train miles, so that the greater part of all revenues derived from the miscellanea carried in the mail-baggage-express cars added up at the end of the year to make the passenger trains very desirable institutions.

Continuing with the same year, for the sake of illustration, we find 237,960 tons of freight were hauled an average of 45 miles, netting

William Moedinger Jr.

Here are kept a Mikado road engine and a lighter helper. Zinc moves south and east to Alamosa on the narrow gauge roads, thence via standard gauge to Amarillo refineries. Lead concentrate goes via narrow gauge to Montrose and from there on standard gauge to Leadville. It is not uncommon for weekly ore freight billings at Rico to exceed $8000. Other carriers, of course, must be paid their share out of the total.

the railroad a little better than $2 per ton or nearly 5 cents for every ton-mile. Yet this rate, five times that received by American railroads today, reflected only a mild prosperity at the end of the year, proving that to move a given tonnage required a tremendous amount of crew and motive-power hours.

As late as 1927, more tonnage moved over Rio Grande Southern tracks than in the first year; and with the exception of one or two years when business conditions throughout the country were low, and 1928 and 1929, when depression in the San Juan preceded that for the rest of the country, Chapter Three is a period of big business for Rio Grande Southern, a period when six or eight steam trains on the line at one time were commonplace. Its last pages, however, were written from 1926 to '29 as gross revenues dropped from $847,000 to $383,000 and operating ratios soared from 83 per cent to 114 per cent. Inevitably the final paragraph was penned when deficits, accumulated during the preceding 20 years, reached the grand total of $2,841,047 in 1929.

The appointment of Victor A. Miller as receiver on December 19, 1929, is the opening paragraph of Chapter Four, which, after 12 years, is still being written. During the first three years of this period, revenues continued to drop until they were less than one-sixth of those in 1926, one-third of those when Miller assumed control; but in spite of it all, Miller was pulling operating costs down until they were less than revenues. Since those dismal days of 1932, business has been on a very gradual upgrade. The 1940 revenues just about doubled the

Durango, in a narrow gauge world.

The Southern and the Grande share this station at Durango, with the RGS offices on the second floor. Here is the center of a narrow gauge empire, a vacation ground beyond compare, with lines to north, south, east and west, and Mesa Verde National Park nearby.

William Moedinger Jr.

W. H. Jackson.

Passenger train, 1895.

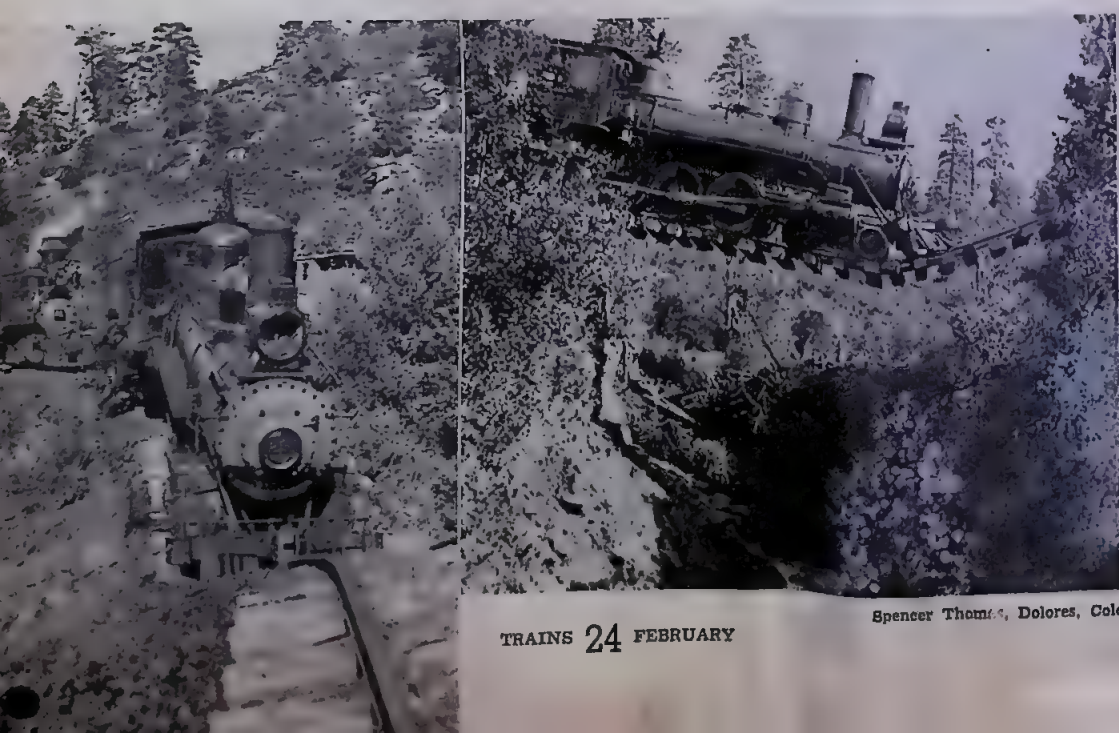
Between Dolores and Durango the southern division of RGS crosses the Mancos-LaPlata Divide, and this photo was taken near the summit in 1895 by the great Western photographer, W. H. Jackson. The double-header freight train is higher up on another loop of the same line. The three-year-old rails and trestle contrast with today's time-worn right of way.

1932 figure, and, after deducting operating expenses for 1940, there remained some $18,000. Even though this figure was $17,000 shy of the breaking-even point after taxes, etc., were deducted, it nevertheless is a rosy picture compared with that of 1929, when the "Southern" spent $56,000 more just running trains than it received from the combined passenger fares and freight charges. There still can be hope that RGS will again show a profit after taxes are paid.

No longer does the "Grande" issue handsomely illustrated brochures describing the 1000 miles through the Colorado Rockies, 530 of them on the narrow gauge; nor does Ridgway bustle in midafternoon with the activity of sightseers and travelers anticipating the ride through the Silver San Juan. Officially, the "Around the Circle" tour of the early twenties is out, and so are important links in the chain of narrow gauge passenger trains that participated in this inimitable trip.

This happened on Friday the 13th.

A washout suspended this engine back in 1909, Friday, August 13, to be exact. The whole affair ended without damage to men or equipment. A culvert carrying the waters of Starvation Gulch under the RGS tracks became clogged, the water piled up, and out went the fill. No. 25 came around the curve right on the advertised with the morning passenger train. Too late to stop in time, the locomotive rolled right out on the suspended track and was later pulled back to terra firma by a spare engine from Rico and a long rope. The fireman jumped; the engineer rode the engine out into space and calmly walked back over the top of the tender to call help. The only inconvenience was the delay to trains while the gulch was filled.



Spencer Thomas, Dolores, Colo.

Passenger train, 1940.

But this time it isn't normal business. Nine loaded coaches would be good business for any road. In this case it means a C. C. C. special, with a rented D&RGW locomotive, RGS helper engine, a couple of box cars for baggage and supplies, coaches rented from D&RGW, and a caboose adorning the rear. The trainload is bound for Montrose, and climbing Dallas Divide.

Otto C. Perry, 74 S. Elati St., Denver, Colo.

In the days of its glory the "Around the Circle" tour began at Salida, 215 miles west of Denver on the standard gauge D&RGW Royal Gorge Route. In one grand day the traveler went west over Marshall Pass and on to Vance Junction, or even Telluride, on the RGS. Or he could take the choice of crossing the railless gap from Ouray to Red Mountain by stage and using the Silverton Northern into Silverton. The Rio Grande Southern train from Telluride went to Durango in one day, and from Durango it was another day over Cumbres Pass to Alamosa. Alamosa is but a short jump from Salida, or overnight to Denver with Pullman sleeper available. The Marshall Pass route saw the last of rail passenger service in 1940.

Fortunately, the 530 miles of narrow gauge track remains intact, and daily passenger service is available over 362 of these miles, so we may yet enjoy an "Around the Circle" tour in a slightly modified form. Whereas the original tour on the slim gauge commenced at Salida, it now begins at Ridgway. If you have never ridden the Colorado narrow gauges, why not let Ridgway and Rio Grande Southern introduce you to this irreplaceable and fading phase in the cavalcade of railroad transportation, during the coming Summer? From the front seat of the *"Galloping Goose"* —beside the operator, where all good railfans are privileged to sit—you'll learn, as you can in no other way, why Rio Grande Southern is allowed to charge more than the standard rate of fare, three cents per mile; as you penetrate deeper and deeper into the San Juan, you'll forget the world of 1942 with its blitzkriegs, and live in a world of 35- and 40-ton locomotives and stub switches; and when the 8 hours 53 minutes have elapsed, you'll agree that Rio Grande Southern, except for size, is second to none.

What's in a name?

Neither Atchison, Topeka nor Santa Fe are on the main line of the Atchison, Topeka & Santa Fe Railway, which runs from Chicago to Los Angeles and San Francisco. Yet the title is not wholly incongruous. Each of the three places has its significance to the railroad. The company was originally incorporated as the Atchison & Topeka Railroad and started to build from Topeka, Kan., to the great Southwest along the old Santa Fe Trail. Santa Fe was the original objective, but the main line by-passed it to continue on to the Pacific. Later, as the road reached east, the main line by-passed Atchison and Topeka and all three namesake cities were left on secondary or branch lines. Topeka still houses the business headquarters of the railroad.

Railroad Sounds Are Music

♪ Even the bark of locomotive exhaust broadcasts an informative story.

EDNA ST. VINCENT MILLAY once grew quite poetical about locomotive whistles in the night. And well she might. Many of us who lack her gift of expressing our feelings have felt just as poetical about those far-away locomotive calls that slip in the window when we are awake in bed.

In years past locomotive engineers were real artists with their whistle cords, and while nowadays they are more practical and matter of fact about this useful instrument of signaling and warning, the whistle note is still something to appreciate, one of the most typical of railroad sounds. It may be the strange whistle of an unknown engine, heard in a hotel room far from home, a call beckoning one to further travel, or it may be the familiar whistle that tells of the passage of No. 57 and so bedtime. Or it may be the strident call of an air horn which tells that tonight the Diesel 5-spot is being used instead of the old reliable.

In much the same vocal category with the whistle is the exhaust. The sharp, high-pressure bark of a locomotive on long cutoff, the rattle of window panes as one of the new high-pressure locomotives passes, the off-beat exhaust of an engine with badly timed valves—all these tell their stories. Several miles away in the still night air a switch engine quickly picks a cut of cars. A freight is tackling a grade and its exhaust coughs slower and slower and finally "ch-ch-ch-c-c-s-s" as the drivers spin. An insistent hum fills the air: a Diesel-electric picking up its load. The hum cuts off momentarily as the Diesel hits a crossing.

But these sounds of the working railroad which come to every city dweller and which mean so much to those who try to understand them are not all the railroad sounds. To the train traveler also come sounds: the muffled hum of wheels on rails, the roar as the car door is opened while the train is going, the clanking of the baggage car ahead against the coach buffer. Is there any sound quite so welcome as the two air blasts when the conductor signals the highball? Or the four blasts of air as he signals the engineer to try the brakes preparatory to leaving a long division-point stop? When the train has stopped unexpectedly between stations and the flagman

Staccato sonata by Frank Quin.

Or would it be better titled "Victory Symphony"? Da, da, da, dum! Funny how a combination of locomotives posed in a photo can be so eloquent of rhythm and harmony. The scene is at Dumont, N. J., on the New York Central's West Shore road.

goes out, everyone welcomes those four or five (depending on direction) long blasts of the engine whistle which recall the flagman ready for the start.

At night in a Pullman berth the sounds come clearer, albeit softer. The roll of wheels beats a lullaby, and brake shoes grab the wheel treads with velvet gloves. Outside the car, at station stops, sounds the porter's "Yas sah." What a puzzle to try to fit the patches of sound together into a sensible pattern, without benefit of sight!

Wheel clicks are a lost rhythm, what with better joint maintenance and well padded cars. But not quite lost, as long as the open-platform observation car exists. For on the open platform the clicks come sharp and distinct as the rails move behind. The rolling seems continuous, and the sound of a train passing in the opposite direction fairly explodes upon this retreat.

Try listening to the trains. They make a music all their own: the music of power and motion, of a country's commerce and travel.

Frank Quin, 8414 88th St., Woodhaven, N. Y.

Hoosac Tunnel

★ Five miles of hand sledging through rock gave country its first long tunnel.

By F. M. Cramer.

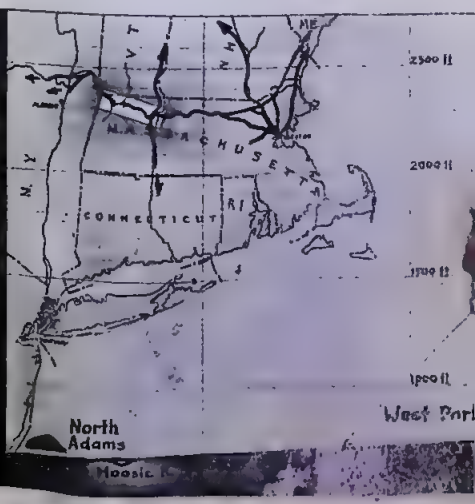
RAILROAD builders have become so adept at conquering insurmountable geographical obstacles that we are inclined to overlook the marvel of a long tunnel or bridge. But let us skip back to 1875, when surely we were not so blase about such wonders! In that year the 4.75-mile Hoosac Tunnel was opened, to be surpassed in length (in the United States) only by the Moffat and Cascade Tunnels, both built in recent years. Today we hardly bat an eyelash at what was in 1875 "bigger, longer, more colossal," the cause of many a newspaper superlative. Yet the Hoosac Tunnel is still an engineering marvel, still the gateway to the west for the Boston & Maine Railroad and an important artery of trade for New England.

As early as 1826 ambitious men were planning a canal from Boston to Albany. The chief difficulty was the crossing of the chain of hills that runs from Canada to southern Connecticut along the western edge of New England. At one point in these hills the Deerfield and Hoosic rivers are only five miles apart, the one flowing east and the other west. This suited the plans of the builders and a tunnel for the canal was proposed. The scheme petered out when it became clear that various small railroad companies were going to consolidate and form a similar route to the south. With the completion of the Western Railroad a route was provided through

Emerging from the west portal.

Out of the west portal of Hoosac Tunnel the Boston & Maine swings north along the Hoosic River valley to North Adams. The three-unit color light signal governs the approach to switches spreading the line into three tracks. All tracks are signaled for traffic in both directions, allowing the fullest possible use of the tunnel.

Arthur Palme, Pittsfield, Mass.



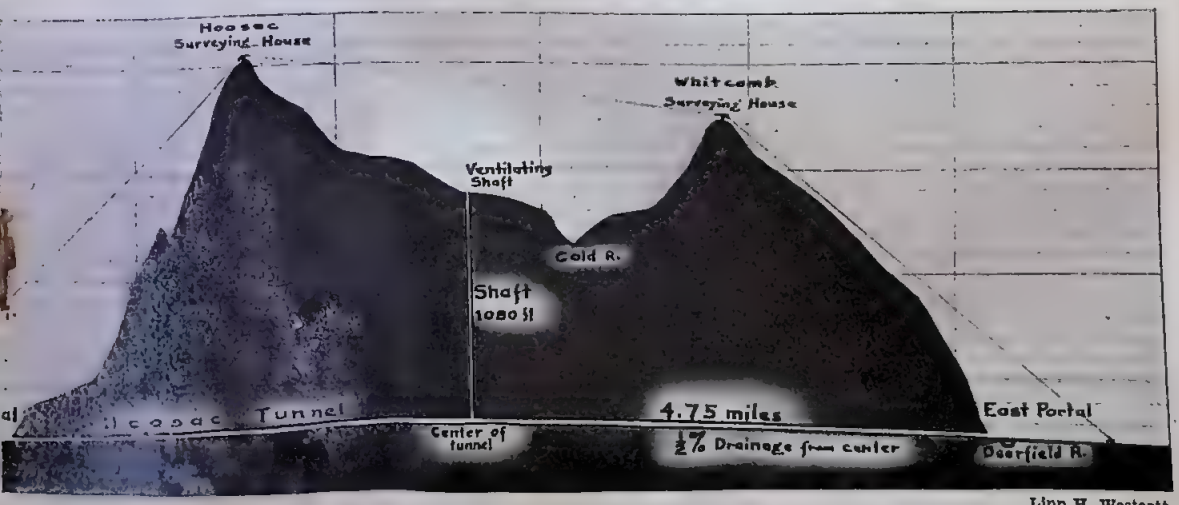
Linn H. Westcott.

the Berkshire Hills via Springfield and Pittsfield, and the tunnel to the northward went into a temporary eclipse.

The idea was revived again in 1854, 12 years later, when the commonwealth of Massachusetts authorized a loan of two million dollars to the Troy & Greenfield Railroad for the construction of a railroad tunnel on the same site. In an undertaking of such a size and nature, state backing and borrowing capacity was essential. The whole venture soon became a political football. Records and reports of two decades that followed are filled with stories of contracts let and relet, investigations, accidents, deaths, threats and personalities between prominent men. Trouble with labor

Across the divide.

Between the furrows cut by the Hudson and Connecticut Rivers rises a divide which must be crossed by all railroads entering New England from the west. How Boston & Maine does it is shown in the map, profile, and tunnel cross section. The Hoosic River drains eventually into the Hudson, and the Deerfield River, on the east side of the summit, drains into the Connecticut. Between the two where they come closest is but five miles of granite mountain, too high to cross but not too tough for the civil engineers who conquered it by tunneling. This illustrates the general technique of railroad route engineering. The railroad follows the rivers and streams when they run in the right direction but sooner or later comes to a point where it must cut across country to the next watercourse to continue its route. This may be easy, or, as at Hoosac Tunnel, a mountain may stand in the way.



Linn H. Westcott.

developed, too, when the men refused $1.80 for a day's work of only eight hours.

From the plan and elevation sketch it can be seen that a central shaft was sunk from a saddle in the mountain to aid in the tunneling operations. It seems, though, that it contributed more harm than good. Of the 195 men killed during the construction period, nearly all lost their lives in or near this shaft. Once 13 men perished when naphtha stored near the shaft exploded and burned the hoisting shack. Another time a man, trying to jump into the descending elevator car, missed and fell 1030 feet. Some time later children playing with the hoisting engine released the clutch and let the elevator fall, killing several men. Next an iron rock-drill rolled into the open shaft and hit a laborer at the bottom. It is little wonder that the shaft never reached tunnel grade until two years after regular train service began. This finished shaft, 1080 feet deep, is now used for ventilation.

Even today civil engineers would consider such a tunneling project an engineering feat. At that time, it must be remembered, pneumatic drills were unknown, and nitroglycerine was commercially available only at the very close of the construction period. A power drilling machine was tried in the early stages but it proved unsatisfactory. The boring was finally accomplished by using iron drills and hand sledges.

Since the work proceeded from both ends of the tunnel toward the middle, it was necessary to have the direction of each of the bores the same and on the right slope. To do this, towers or surveying stations were erected on the two high points of the mountain directly above the line of the bore. From these points sights and back sights were taken to new points on the hills beyond and on about the level of the tunnel openings. Setting up the transit in the progressing tunnel, the engineers could aline themselves on these new points and then lay out the direction of the advance. As a tribute to their accuracy the two headings met a bit to the east of the central shaft with a misalinement of only 9/16"—about the diameter of a 10-cent piece. Even today, from a civil engineering point of view, tunnel work is considered satisfactory if the headings hit "within a dime."

Most of the mountain is of hard granite, and no lining was necessary except for 0.5 mile of the western end, where underground quicksand deposits and heavy veins of water were encountered. This section has brick lining laid right inside the original timber supports. In many spots the lining is a barrel arch or complete circle. All in all, a total of 7573 of the tunnel's 25,081 feet is brick lined.

As originally constructed, the tunnel had an upper arch radius of 13 feet in the bare rock section with about a 12-foot radius in the masonry section. The bore is perfectly straight. One can stand at the center and (providing there is no smoke nor fog) see tiny pin-points of light at the portals. To gain an appreciation of the size of this tunnel, consider a common lead pencil 39 feet long. That is the diameter and length of the tunnel to scale. From the center there is a slight downgrade of one-half per cent or 26.40 feet per mile as an aid to drainage.

Early Operation and Electrification.

As the smaller railroads consolidated their operations and the industrial revolution gained headway, traffic through the tunnel increased to the extent that smoke was not only a nuisance but a hazard. The heat and chemicals in the smoke were together having a very bad effect on the exposed rock overhead. The smoke itself, like fog, kept visibility at a low value. Originally the central shaft carried off this smoke much as a natural chimney, but in 1899 it was found necessary to install a large fan at the top of this shaft. The fan, still in use, measures 16 feet across and was originally steam-engine driven.

The installation of the fan was not a lasting solution. Oil-burning steam locomotives were tried but the major faults remained. The decision to electrify the tunnel and its approaches came in September, 1910. This was no small undertaking. No tunnel so long had ever been electrified. To add to the difficulties, operation of the regular train schedule was required during construction, and though oil-burning engines were used they still emitted noxious fumes.

Costing an estimated 12 million dollars, the project covered the electrification of 21.31 track-miles. Beginning at a short tunnel just west of North Adams Station, the two tracks are electrified to the station; east of the station the yard begins and four tracks are covered. Beyond the yards it is three tracks of main line for two miles to West Portal. The tunnel itself is two tracks and 4.75 miles long.

Arthur Palme.

At the east and west ends of Hoosac Tunnel.

The tunnel inspection crew gets ready for a trip through, in the above photo taken at the west portal. The big doors are used in Winter weather to cut down the draft. The internal temperature varies little throughout the year, but the air is moist and frost is formed when it strikes the cooler sections. The trolley wires are insulated into sections at the tunnel entrance, and the double insulators are to support the two parallel sets of catenary, one continuing into the tunnel and the other starting at the portal and running west in the open. The pantograph bridges the two parallel wires at the moment of passing. Below, a heavy freight waits at the east portal. Notice the Hoosac Tunnel & Wilmington engine in the background.

A. O. Wilkins, 163 Essex St., Saugus, Mass.

From East Portal to .25 mile east of Hoosac Tunnel Station there is .75 mile of two-track main line and a three-track yard. In route miles all this amounts to 7.92.

The overhead catenary is of the three-wire type having catenary, messenger and trolley wires. The trolley is No. 4/0 grooved copper wire. The hangers are of steel angle construction within the tunnel with the insulators "underslung"—that is, carrying the weight of the catenary in compression, the insulator being in the space between the catenary and the messenger. To take the hanger bolts 1000 holes 2½" in diameter by 18" deep were drilled in the rock roof; for the telephone lines an additional 1500 holes 1¾" in diameter by 6" deep were drilled. This installation gave a clearance of 15'-6" in the tunnel. Purchased for this service were five Baldwin-Westinghouse 2-B+B-2 electric locomotives. An additional two were bought in 1917. The numbering runs consecutively from 5000 to 5006 inclusive, and the color is a very, very dark green. They are all 130-ton locomotives with a continuous rating of 1200 horsepower at 25.5 miles per hour. Length over all is 48 feet. The drive from each of the four motors is through a geared quill, a flexible arrangement of the driven gear on the drive-wheel axle. Control is effected through electropneumatic equipment operating on the main transformers. Power from the trolley to the high side of the transformers is 11,000 volts, single-phase 25-cycle alternating current. Maximum voltage to the motors is limited to 300. There is no train heat boiler, since the steam locomotives remain attached to the trains. Though repairs and replacements have been made, the original locomotives are still in service. Locomotive maintenance is performed at North Adams.

Power was supplied until about 10 years ago from a steam power station near Xylonite, Mass., several miles south of North Adams. Now hydroelectric power is secured from the 5000-horsepower Station No. 5 at Monroe on the Deerfield River. The input to the electrified zone is still from the North Adams end, being carried over the Hoosac mountain on steel high-tension towers. To insure continuity of service parallel lines have been installed. If at any time sleet forms on the lines, one pair of wires is shorted at the North Adams end. The power is then put on and the heat generated melts the accumulated ice. A 60-cycle tie-in with a local utility is maintained at Station No. 5 to cover any station failures. The feed to the trolley is from the North Adams substation to a main feeder tapped off at regular intervals.

A rigid block-signaling system is always necessary in tunnel operation, and in the early days staff signaling was used. Today automatic train control is the method and is accomplished through General Railway Signal Company induction-shoe equipment. Rails are used, of course, for one side of the power circuit; reactance bonds are used for coupling signal blocks to give a solid ground return for the 25-cycle propulsion current. Wayside signals are three-indication color light and in the tunnel are spread every 5000 feet with blocks the same length. Both tracks are signaled for operation either way, and from West Portal to a spot called Sprague's Cabin three tracks are signaled that way. Switches are electrically operated at the track in most cases, but at the ends of the tunnel the crossovers are rod-and-lever-operated. Signal power is from a local battery.

Heading for the Hoosacs.

Boston & Maine time freight No. RB-2 (Rotterdam-Boston No. 2) heads east through Johnsonville, N. Y., behind one of the B&M's Lima-built Berkshire (2-8-4) locomotives. The curious look comes mostly from the outside-mounted Coffin feedwater heater.

A. O. Wilkins.

Operation.

As a matter of cautious operating policy, six locomotives are

What famous railroad runs are these?

Between which cities do the fastest trains make (1) 85 miles in 75 minutes—(A) Chicago and Milwaukee or (B) St. Louis and Kansas City? You knew it right off. The answer is 1-A. How about other runs which are well known by mileage and running time? Can you match the mileages and running times with correct pairs of cities? This is tough, but the hints will help. Of the 15 answers, 10 correct means you should apply for a job behind the Union Station information window, 6 right means plenty good for an amateur, and 3 right means keep on reading TRAINS and you'll improve. The shortest, or rate base, mileage is given in each case.

1. 908 miles in 16 hours (extra fare). M
2. 470 miles in 9½ hours (two a day each way).
3. 225 miles in 215 minutes (Eastern). I
4. 284 miles in 4¾ hours (near the Great Lakes). H
5. 921 miles in 20 hours (north and south). B
6. 229 miles in 4¼ hours (partly electrified). D
7. 1034 miles in 16 hours (overnight across the prairies). N
8. 421 miles in 6¾ hours (Budd-built). G
9. 303 miles in 5¼ hours (two C's of Big Four). A
10. 2188 miles in 58¾ hours (no streamliners yet). C
11. 1387 miles in 24 hours (big Winter traffic). F
12. 91 miles in 90 minutes (almost a commuter run). O
13. 488 miles in 8 hours (one of the newest fast-steppers).
14. 264 miles in 4 hours 25 minutes (orange, red, and black). K
15. 279 miles in 5 hours (along a big river).

Now match each letter with the correct number:

A. Chicago-Cincinnati.

B. New York-Miami.

C. Chicago-Seattle.

D. New York-Boston.

E. St. Louis-Kansas City.

F. Chicago-New Orleans.

G. Houston-Dallas.

H. Chicago-Detroit.

I. New York-Washington.

J. San Francisco-Los Angeles.

K. Chicago-Minneapolis.

L. Denver-Chicago.

M. New York-Chicago.

N. Chicago-Omaha.

O. New York-Philadelphia.

For answers see page 37.

on the active list and one is held in reserve at North Adams. The weights of the various trains to be hauled vary, but three units are always sufficient and so, since they may be operated as multiple units, three are usually left coupled. One locomotive will handle 50 loaded cars. Westbound trains stop near Hoosac Tunnel Station, where the electric units are coupled on ahead. The fire on the steam locomotive is banked. If it is a freight train it is towed through the tunnel at 15 miles per hour, taking 20 minutes for the passage. In the yard beyond West Portal the electric engines are dropped off and the train proceeds behind the steam power. If it is a passenger train it is towed through at 30 miles

Arthur Palme.

The tunnel special.

Locally built especially for tunnel service is this motor car with its Chevrolet motor. Lacking a real muffler, the engine creates such a racket that conversation between riders is impossible in the tunnel. The maintenance crew is riding, and the man at the right is James Shaw, the superintendent responsible for this section. The fenders in front of each wheel are to clean the rails of small rock chips which might be enough to derail the motor car, although they would be crushed without trouble by a road locomotive.

per hour. No following train will be allowed to enter the tunnel on this same track until the passenger train has cleared. The regular scheduled stop is made at North Adams and the electric engines are dropped during the stop. Eastbound freight and passenger trains are picked up at the yards and the station, respectively, and returned to steam power again at Hoosac Tunnel Station. During these trips passenger train brakes are carried on 90-pound air and freight train on 70-pound air.

The tunnel and its equipment are not yet loaded to fullest capacity, though there are some 40 trains per day through the tube, including the Boston & Maine's fast *Minute Man* to and from Chicago. Freight interchange is maintained at North Adams with the branch of the Boston & Albany Railroad coming up from Pittsfield, and at Hoosac Tunnel Station with the HT&W RR., affectionately known as the "Hoot Toot & Whistle" but actually the Hoosac Tunnel & Wilmington Railroad, 25 miles long. This latter road, by the way, has a story all its own, as many railfan trip enthusiasts will tell you.

Maintenance.

The maintenance of such an item as a tunnel is no small matter. The sides and roof as well as the track need constant attention. Only a well-organized schedule of preventive maintenance will keep down the cost and frequency of emergency maintenance. The schedule is built around the work of a track walker and the semi-annual inspections.

As an eight-hour task the track walker has the job of walking through the tunnel and back, over 9.5 miles. He is concerned chiefly with the condition of the 100-pound rail with which the track is laid. Carrying an acetylene lamp, he is also able to inspect the side walls and the roof. The acetylene lamp is used because of its dependably bright light that will operate even though the lamp be turned face down. Loosened rocks are the biggest danger, since they might fall and damage a passing train, or lying on the rail they might cause a derailment. So that immediate reports may be made, telephones are set into the wall every half mile as well as at each signal. For his protection a track walker's safety niche has been blasted out of the wall every 250 feet.

Another duty of the track walker, and engine men too, is to report the presence of fog and smoke in the tunnel. As was mentioned before, a large engine-driven fan was installed at the head of the central shaft to clear out locomotive smoke during the days of steam operation. Driven now by a large synchronous motor, the fan can be operated in either direction. Thus it can draw or blow. Based on the reports received by the tower men from the track walker, the fan operator can determine whether it will be quicker to blow an obstructing cloud out the portals or draw it up through the central shaft.

To transport maintenance personnel the customary gasoline motor car is provided. This particular one is of local manufacture. Power is supplied by a six-cylinder engine through a chain drive. If at any time the crew is caught in the tunnel ahead of a train in it stops to work, the buggy may be set off in any one of eight niches spaced 3000 feet apart.

When a job runs through the lunch hour the crew can make use of a room blasted out of the wall at the base of the central shaft. The furnishings are typically railroad and include a table and benches, a stove and, of course, electric lights.

Whenever a train stalls in the tunnel the heat from the stack of the steam locomotive is concentrated on one small area. Even though the fire is banked, experience has shown that if the duration of the stall is more than 10 minutes parts of the roof may be loosened dangerously. The heat causes the rock to expand unevenly, setting up excessive stresses, while the sulphurous acid formed during the condensation of the steam readily attacks the rock structure. In cases where the stall is longer than 10 minutes a mining gang is sent in immediately day or night.

The second phase of inspection covers that which is made semi-annually. This inspection is carried on during the night, when traffic is light. One track is worked on at a time and taken entirely out of service. The roof and side walls are inspected inch by inch. In addition the overhead installation is checked. This inspection takes six nights. An extra inspection had to be scheduled in the Fall of 1940 following a series of earthquakes and tremors that shook New England and New York State. Oddly enough, no damage was discovered.

The engine men are a great help in checking the condition of the tunnel. From their many daily trips through, these men have developed an extraordinary ability to spot slight changes and imminent fissures in the rocks. One engine man, the late Gordon Scheffer, was credited with knowing every bulge and bump in the tunnel walls. He could instantly spot any change in contour.

As a credit to both the maintenance and traffic crews it may be said that no passenger fatalities have ever occurred in connection with the tunnel. In fact, there has been only

This is only a triple-header.

In spite of four engines, this is only a triple-header. The steam locomotive is not working. Fires of steam locomotives are banked and they do not work while the electrics take them in tow for the passage through the Hoosac Tunnel. Seven electric units are used for the tunnel service, and one of these is usually kept in reserve. The other six can be operated singly or in multiple unit as needed, but are usually kept in sets of three. Since a train takes only 20 minutes for the trip, two sets are enough for even the heaviest traffic. Trolley voltage is 11,000, 25-cycle A. C.

A. O. Wilkins.

Arthur Palme.

Electricity solved the tunnel ventilation problem.

Locomotives 5000, 5006, and 5005 wait at Hoosac Tunnel Station, near the east portal, for a heavy freight. They will couple on ahead of the road engine to take train and engine through without smoke difficulties. Each electric locomotive unit weighs 130 tons, has two driving trucks with four drive wheels and two pilot wheels each, and a weight on drivers of 102 tons. The horsepower at one-hour rating is 1232, this being at the wheels rather than simply engine horsepower as in the case of figures quoted for Diesels. The maximum starting tractive effort is 72,000 pounds, somewhat more than that of a typical 4-8-4 steam freight locomotive. An electric locomotive is also rated as to tractive effort on an hourly basis, meaning the tractive effort which can be exerted for an hour without overheating the motors, and this for the 5000's is 18,480 pounds.

Collection of F. M. Cramer.

N. Wetherbee, 105 Washington St., Braintree, Mass.

Westbound freight climbing the hill to the tunnel.

Santa Fe type locomotive No. 2920 pulls a westbound Boston & Maine freight up the hill at Charlemont, Mass., heading for the Hoosac Tunnel a few miles west. B&M fast freights give second night or early third morning freight delivery between Boston and Chicago, and some very fast service is likewise operated between Portland and the West. The heavy power of the road is its Santa Fe class, but for the faster freights the newer Lima-built 2-8-4's or the still newer Baldwin-built 4-8-2's are better suited. In these last engines, the 4100 series, the overbearing look of the outside-mounted Coffin feedwater heater has disappeared, and the lines are sleek and clean. Smoke deflecting plates give a modern touch, and the latest 4-8-2's, Nos. 4113-4117, have the new 14-wheel curved bottom tenders first used on the Union Pacific.

one accident in all the years it has been in service.

Except for enlarging certain parts of the bore to the size of the largest clearance diagram, no large-scale repairs or alterations have been made since the tunnel was completed. Prior to 1927 a number of other railroads had cars that could not pass through the tunnel because of the limited clearance. This meant the loss of considerable revenue. On December 1, 1926, the major operation of enlarging the tunnel while in use was completed. Schedules were rearranged so that by taking out of use only one track at a time it was possible to maintain regular service.

No work was necessary in the eastern half of the tunnel, since that half had no brick lining and was quite big enough. Using air drills and dynamite, the construction crew started at the center and worked toward the west portal. Rather than tear out the brick work the bed was blasted and a new base for the ballast established. The drainage culvert between the tracks was lowered and where the rock was not suitable a 24″ pipe was installed. The enlargement and a rearrangement of the overhead wires gave added clearances of from 5 to 18 inches. As completed, a clearance of 5 inches is provided over a 15′-10″ car, and at 14 feet above the rails a maximum eaves width of 10′-6″ is available. This operation modernized the tunnel and has made it capable of meeting all traffic demands.

Answers from page 33.

1-M	6-D	11-B
2-J	7-L	12-O
3-I	8-K	13-N
4-H	9-A	14-G
5-F	10-C	15-E

The Day of Two Noons

★ Once each railroad had its own standard time; making connections was like a problem in calculus.

*By Carlton J. Corliss.**

YES, there was a day of two noons! This phenomenon occurred on Sunday, November 18, 1883. It was the day on which standard time, sponsored by the railroads, was adopted throughout the United States and in many parts of Canada.

With the possible exception of the change from the Julian calendar to the Gregorian calendar† in the seventeenth century, no other time reform in all history was of greater significance than the adoption of standard time.

It is safe to say that standard time has had a more far-reaching influence upon the habits of the human race than any other time-reckoning reform in all history. The adoption of standard time also marked a great forward step in the unification, simplification and efficiency of railway operations, but in order to appreciate its significance we must understand the conditions which existed prior to November 18, 1883. Then the only time that existed in this country was local time, or "solar time," which was based upon the passage of the sun across the meridian, and which varied in the latitude of Chicago approximately one minute for every 13 miles or one second for every 1140 feet of longitude.

If a person standing at the end of the Municipal Pier, Chicago, and another person standing at the Chicago & North Western station, on West Madison Street, each had his watch adjusted to exact local, or "sun time," the second hands of these two watches would differ by about 10 seconds. Sun time at the eastern and western extremes of Chicago differs by about 67 seconds. It differs about 5 seconds at the two ends of Brooklyn Bridge, while from the Capitol dome in Washington to the Lincoln Memorial there is a difference of 7 seconds.

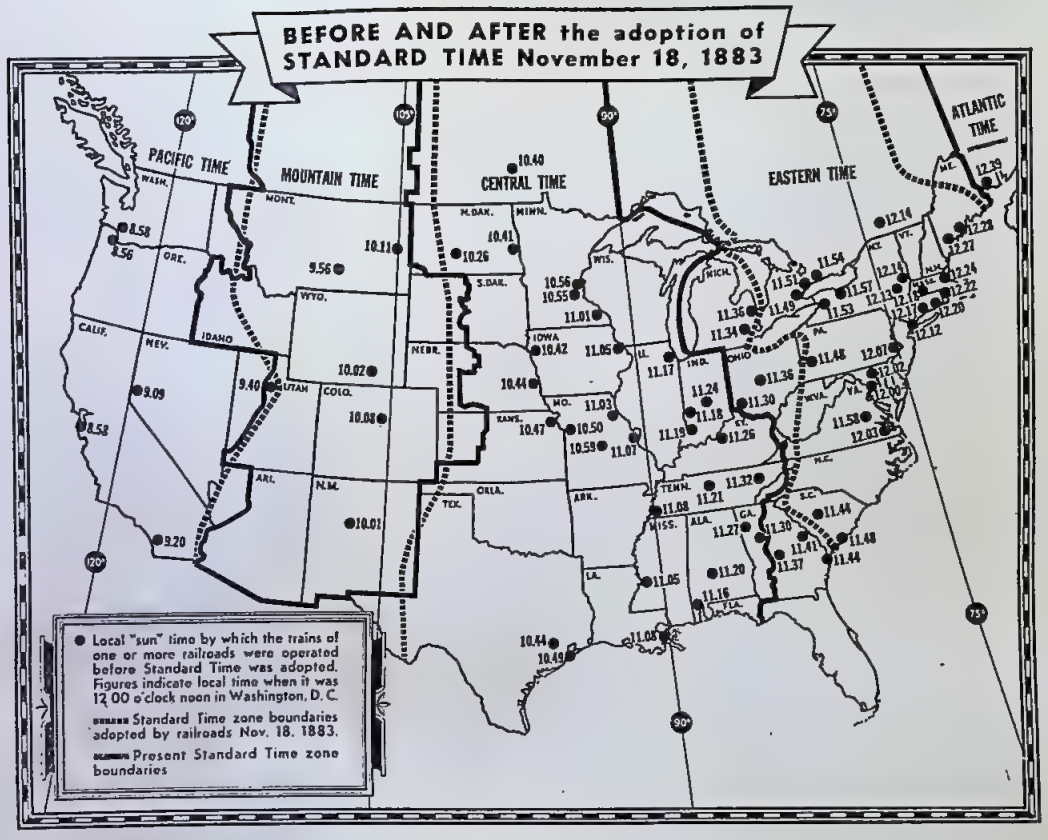
So, of course, such a thing as true local or sun time was never observed at all points in the country. This would have led to unending confusion, because the longitudinal variation is constant. Moreover, owing to the eccentricity of the earth's orbit, there is a seasonal variation of several minutes, so that exact sun time at a given point on the earth's surface in January will not correspond to exact sun time at the same location in April or August or November.

But each of numerous cities or towns adopted a time standard which was based upon mean local sun time at the city hall or some other designated location. Many another city or town adopted the time standard of one of its railroads or of the principal city in its area. Each railroad adopted the time standard of its home city or of some other important city on its lines.

For instance, the Pennsylvania Railroad in the east used Philadelphia time, which was 5 minutes slower than New York time and 5 minutes faster than Baltimore time. The Baltimore & Ohio Railroad used Baltimore time for trains running out of Baltimore, Columbus time for trains in Ohio, Vincennes time for trains running west of Cincinnati, and it scheduled some of its trains under New York time, Philadelphia time and Chicago time. The Michigan Central Railroad operated its trains on Detroit time. In the Chicago district, the New York Central (then the Lake Shore & Michigan Southern) and the Pennsylvania (then the Panhandle) used Columbus time, which was 6 minutes faster than Cincinnati time and 19 minutes faster than Chicago time. Generally speaking, the railroads running westward and southward from Chicago used Chicago time; those running westward from St. Louis used St. Louis time.

* Courtesy *Chesapeake & Ohio Magazine.*

† The greatest time jump in all history was the change from the Julian calendar to the Gregorian calendar in 1672, by which September 3, old time, became September 14, new time. This radical reform led to riots. A mob followed the ministers' carriages with sticks and stones, crying out, "Give us back our 11 days!"



There is no telling how many different "local times" there were in the entire country prior to the adoption of standard time, but we do know that there were at least 68 different times used by the railroads, and, according to one authority, there were, a few years prior to 1883, something like 100 different times in use by the railroads of this country. Thus when it was noon in Chicago, it was 12:31 in Pittsburgh, 12:24 in Cleveland, 12:17 in Toledo, 12:13 in Cincinnati, 12:09 in Louisville, 12:07 in Indianapolis, 11:50 in St. Louis, 11:48 in Dubuque, 11:41 in St. Paul, and 11:27 in Omaha.

In the railroad station in Buffalo, there were three clocks—one set to New York time, by which the New York Central operated; one set to Columbus time, by which the Lake Shore & Michigan Southern and other railroads were operated; and the other set to local Buffalo time.

The situation was even worse in Pittsburgh, where there were six different time standards for the arrival and departure of trains.

A traveler going from Eastport, Me., to San Francisco, if anxious to have the correct railroad time, was obliged to change his watch some 20 times during his journey!

In Kansas City each of the leading jewelers furnished his own "standard time," and no two of these agreed. Sometimes the range was as much as 20 minutes. Each jeweler had his own customers who set their watches by his regulator and

William F. Allen.

Every city had its own time standard.

Some cities had more than one! This reproduction of the cover of the *Official Guide* for March, 1871, is graphic evidence of the need for time standardization. Notice that Baltimore was two minutes behind Washington, Milwaukee a minute ahead of Chicago.

were willing to wager on the correctness of his time. According to one account, "the people of Kansas City never did have accurate information on the arrival and departure of trains, except such as was gained by going to the edge of the hill and looking down on the railway station." The situation became so notorious that a professor from Washington University in St. Louis was called upon to untangle the mess. The problem was solved by the city's adoption of a time-ball system. However, this does not mean that all railroads operated in and out of Kansas City on the same standard of time or that Kansas City time was the same as the time of Omaha, St. Joseph, Topeka and other cities in that area.

Of course, with such multiplicity of time standards throughout the country, passengers and shippers, and railway officers and employees who were responsible for the operation of trains, the sale of tickets and the making of schedules, were confused and bewildered; mistakes and errors were frequent and sometimes disastrous. According to the New York *Herald*, "The confusion of time standards was the source of unceasing annoyance and trouble."

Proposals for a uniform time system were not new. As early as 1828, Sir John Herschel mentioned the value of standard time. On December 6, 1848, Greenwich mean time became the standard time of England, Scotland and Wales. One of the early advocates of standardization in this country was Prof. C. F. Dowd of Saratoga, N. Y., who in 1869 proposed dividing the country into time zones, similar to what we have today. Several other scientific men advocated a uniform standard.

The railroad movement may be said to have had its beginning on May 14, 1872, when the association which eventually became the Association of American Railroads held its first meeting at the old Southern Hotel in St. Louis. This was a meeting of railroad superintendents for the purpose of arranging a Summer passenger train schedule. At the St. Louis meeting was formed the permanent organization which became successively the Time-Table Convention, the General Time Convention, the American Railway Association, and finally the Association of American Railroads.

For many years the secretary of the General Time Convention and the American Railway Association was William F. Allen, managing editor of the *Official Guide*. In his capacity as secretary of the General Time Convention, Mr. Allen worked untiringly for the adoption of standard time. In the waiting room of Union Station, in Washington, there is a large bronze tablet which gives William F. Allen the credit which is due him for his part in that very important achievement.

The plan which was adopted provided for five time zones—one, to be known as Intercolonial Time, in the eastern provinces of Canada, and four in the United States, to be known as Eastern, Central, Mountain and Pacific times. The four United States zones were based upon mean sun time on the 75th, 90th, 105th and 120th meridians west of Greenwich (15 degrees or 1/24 of the circumference of the world apart). These four meridians are approximately on the longitudes of Philadelphia, Memphis, Denver and Fresno. Having voted overwhelmingly for the adoption of the plan, the convention issued a notice directing that all railway clocks governing the operation of trains throughout the United States be set to the new standard at exactly 12 o'clock noon, Sunday, November 18, 1883.

Detailed instructions and recommendations were issued, giving the exact changes which were necessary for the various railroad companies to adjust their clocks and watches to the new standard, and similar information was furnished various cities. It was realized that the success of the plan would depend largely upon the cooperation of cities and towns in adopting the new time locally, and this was stressed by the General Time Convention and by railway publications. Newspapers and local public officials enthusiastically approved the change, and only here and there was there serious opposition to it, by those who felt that they were being robbed of some of their daylight, or were being compelled to reckon time "contrary to nature."

November 18, 1883, was called the "day of two noons" because in the eastern part of each time zone there was a noon based upon sun time, and another based on standard time.

Said the New York *Herald*, "Those in the eastern half of the zone are, as it were, 'living a little of their lives over again,' but those on the other side are thrown, some of them as much as half an hour, into the future."

And New Yorkers noted with a chuckle that they had cheated old Father Time out of 240 seconds!

In a nation-wide time change such as this, the railroads had no previous experience. The adjustment called for careful planning and preparation and the greatest of care and watchfulness by railroad officials and employees. Specific orders were issued on every division, instructing every officer and every employee as to what should be done in making the change. Train crews on line were instructed in every instance as to what change to make in their watches. Members of each crew were also instructed to check their watches with the telegraph operator upon arrival at the next scheduled stop.

Sunday was selected because there were fewer trains in operation at that time and the change could be made with the minimum of inconvenience and the maximum of safety.

Commenting on the annoyance caused by the change, one newspaper editor said:

"The change in time may be annoying to some, but those who are so annoyed should console themselves with the reflection that there is in the Fiji Islands a house which is so divided by the 180th degree of longitude that when it is Sunday in the parlor it is Monday in the kitchen."

Many cities and towns located on the border line between two time zones found it difficult to decide which time to adopt. Pittsburgh and Buffalo were on the border line between the Eastern and Central time zones, and public opinion in those cities was divided as to which time should be used by business establishments, schools, churches, theaters, and citizens generally.

A St. Louis newspaper facetiously remarked that it wouldn't make much difference whether some of the Western cities, like North Platte and Dodge City, used Central Time or Mountain Time "except to a man who was about to be hanged." Said the editor, "He will be good for another hour of life if he can induce the sheriff to stage the act by Mountain instead of Central time."

Many legal complications resulted from the changes in time. An interesting case was reported from Iowa. This case involved the question of whether a fire insurance policy which expired at noon of a certain day should be governed by solar or standard time. If the sun time governed, the policy was in force when the fire broke out; but if standard time governed, the policy ceased to be in force 2½ minutes before the fire started. The Supreme Court held that the presumption was that the parties to the contract intended sun time and decided in favor of the policy holder.

There were many amusing incidents and a few slight hitches in changing from local to standard time in various parts of the country. For instance, the mayor of Bangor, Me., refused to recognize the new time on the ground

that it was unconstitutional. He even threatened to have the police prevent the churches from ringing their bells on the new time, but popular feeling ran against him and he did not carry out his threat.

However, he continued to display the courage of his convictions, and Standard vs. Sun Time became a first-rate political issue in Bangor. The city council voted for standard time; the mayor promptly vetoed the order, declaring that no one had power "to change one of the immutable laws of God."

There were others who were convinced that a mistake was made in not adopting 24-hour time, thus abolishing the necessity of using a. m. and p. m. The Richmond *Dispatch* strongly advocated 24-hour time, stating that there was no good reason for not adopting that system, attributing failure to do so to "prejudice," and concluded its editorial with "Away with old fogyism about 24-hour time!"

The Detroit *Evening Journal* actually did adopt 24-hour time and published its paper with headings reading 14 o'clock edition, 16 o'clock edition, etc., proclaiming itself ahead of the times.

The Cleveland, Mount Vernon & Delaware Railroad, now a part of the Pennsylvania Railroad between Cleveland and Columbus, published timetables on a 24-hour schedule. For instance, Train 4 left Cleveland at 14 o'clock, arriving in Columbus at 21:10 o'clock. Train 3 left Columbus at 11:40, arriving in Cleveland at 21:04. The timetable stated:

"The system used in the above table consists in avoiding the confusing division of the day into two equal portions of 12 hours, and employing instead a continuous count from 1 to 24 hours. The days begin at midnight, as under the common system, but there is no possibility of confusion between the forenoon and afternoon hours."

But a few months after standard time was adopted this railroad fell in line with other roads and published its schedule in the conventional style.*

The American people soon came to accept standard time without question, and it has since spread to other lands until today it is in almost universal use.

It is an interesting fact that the method of reckoning time instituted by the railroads in 1883, although adopted and used by the federal government and the states, cities and towns throughout the country, was put into effect without federal legislation of any sort. It was not until 35 years later—on March 19, 1918, during World War I—that Congress passed the Standard Time Act.

The Standard Time Act gave the sanction of the federal government to the four-zone system adopted by the railroads and provided for "daylight saving" to conserve fuel and increase national efficiency. The Interstate Commerce Commission was empowered to define by order the boundaries of each standare time zone.

Daylight-saving went into effect throughout the country on March 31, 1918, but it proved so unpopular that in the Summer of 1919 Congress passed a bill repealing the daylight-saving provision of the Standard Time Act. President Wilson vetoed it. But Congress passed it over his veto, and national daylight-saving ended in October, 1919.

Since the Standard Time Act was passed, the Interstate Commerce Commission has made several important changes in the boundaries of time zones, one of the latest being the transfer of Michigan proper and western Ohio from the Central zone to the Eastern zone. [There have been proposals to put all the country east of the Rockies into a uniform time zone.]

Of timely interest is the bill pending in Congress as this issue goes to press, providing for daylight saving time throughout the country for the purpose of conserving fuel and electrical energy in the national emergency. This would simply put the country ahead an hour without disturbing the present four-zone standard time system. It would be a great improvement over the confusing hodge-podge of Summer-only "daylight saving" systems now superimposed upon the standard time system. This confusion is illustrated by the story of the Pullman porter who, while en route from Chicago to New York, was asked about the time of arrival.

"Well, sah," he replied, "ef yo' ain't changed yo' watch and ef yo' still has Chicago railroad time, yo' will arrive at 9 o'clock. Ef yo' has Chicago daylight savin' time yo'll arrive at 10 o'clock. By New Yo'k railroad time, yo' is due at 10 o'clock. But, then, New Yo'k has daylight savin' time, so yo' is due at 11 o'clock. But we'z an hour late, so, ef we don't make it up, it look lak yo'll arrive at 12 o'clock."

* 24-hour time has been used successfully by the railroads in Europe for years.

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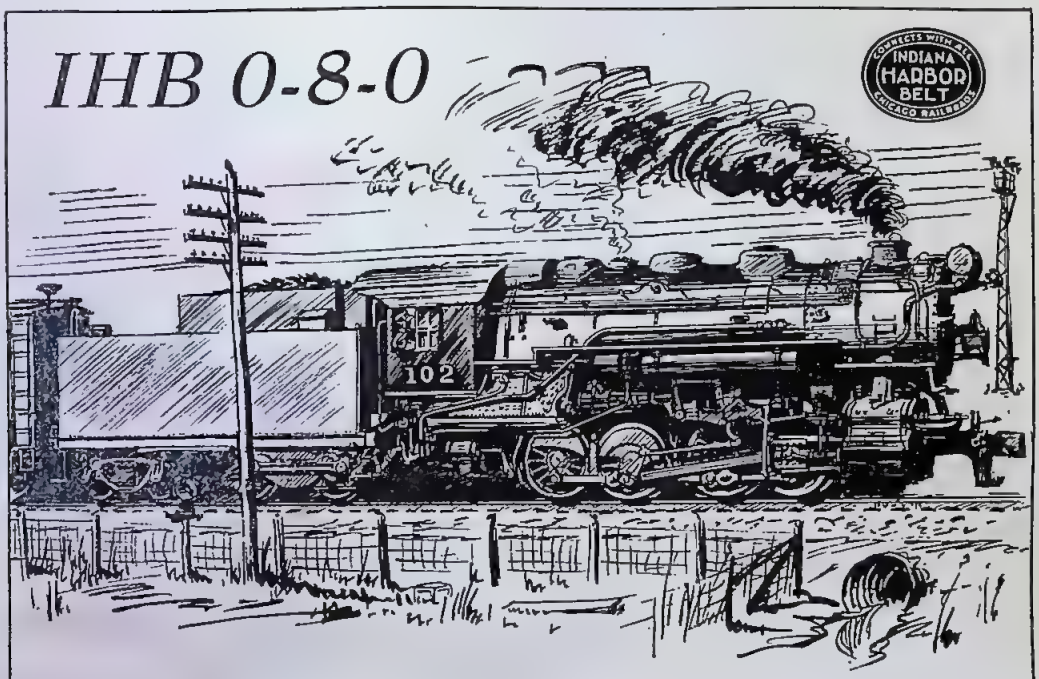
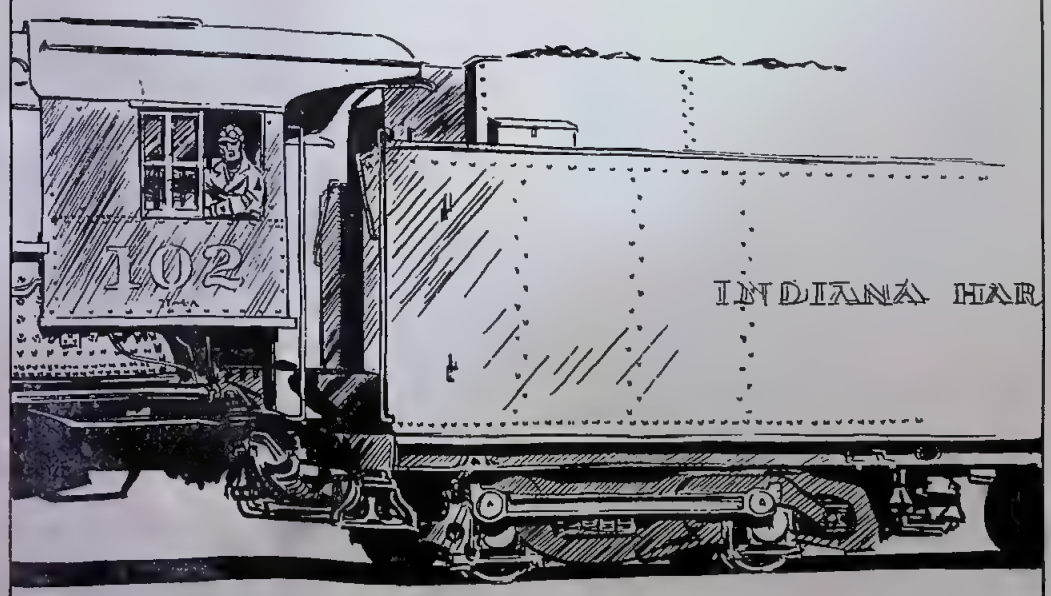


Three of these Class U-4a switching engines were delivered to the Indiana Harbor Belt Railroad by American Locomotive Company in February, 1927. The design is exceptionally well done; every unit is placed as closely as possible to its basic function. These locomotives have all the appearances of road engines, unusual for motive power intended for heavy yard service. Weight of 294,000 pounds rests on 57" drivers. The two outside cylinders are 23½" x 32", while the third cylinder is 23½" x 28" Tractive force of the engine alone is 75,700 pounds backed by a boiler pressure of 200 pounds.



The tender has a capacity of 12,000 gallons of water and 15 tons of coal. The 13,800 pounds of booster tractive force added to that of the engine brings the total tractive effort to 89,500 pounds.

PVT. GIL REID FT. LEONARD WOOD

Hotel Pullman

★ **Between 275 cities sleeping cars provide overnight service for more than 40,000 guests a night.**

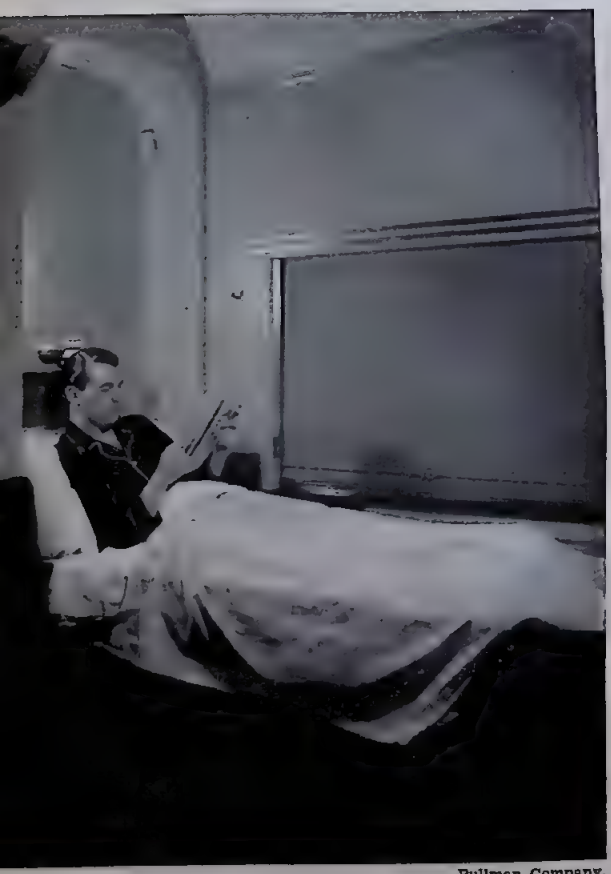
"I WANT an air-conditioned room for about $4 and have the room, and me, in Washington tomorrow morning, please." A New York hotel clerk would be mighty startled at such a request, but worded a little differently it wouldn't faze a railroad ticket agent at all. Every night Pullman, in its fleet of railroad cars, plays hotelkeeper-host to some 40,500 overnight guests and every morning these 40,500 wake up in different cities from those in which they retired.

This really gigantic combination of the transportation and the hotel businesses, which plays such a large part in the fast business tempo of the United States, is all an outgrowth of the first Pullman car built by George M. Pullman in 1859. Perhaps Mr. Pullman in his earliest plans thought of the sleeping car only as a means of adding comfort to travel, for in those days time wasn't as important as now. Or it may well be that the man who had enough foresight to develop the original idea could also foresee the time to be saved by allowing people to travel and sleep during the hours they would ordinarily spend asleep in a stationary bedroom.

Today, a business man in New York, on receiving word that his presence is needed in Washington the following morning, need not immediately rise from his desk and catch the earliest possible train. He can work until his usual closing time, go home and have a leisurely meal and thumb through the evening papers before leaving for the station. He can even take in a night spot, if he wishes, and still be in Washington the next morning. On the Pennsylvania Railroad, for instance, he has a choice of two departure times. He can leave either at 12:50 a. m. or 4:05 a. m., arriving in Washington at 7:15 or 8 a. m. respectively.

"That's all very fine," the uninitiated might say, "but how does he get any sleep? Even the 12:50 train requires him to stay up until 1 o'clock or so."

But it doesn't. Our New York business man can enter his Pullman car for either of those trains as early as 10:30 p. m. He can be under the covers, or even asleep, by 10:45. His car is



Pullman Company.

Luxurious relaxation.

Just because you choose to retire early you don't have to go right to sleep. Well-placed lights allow you to enjoy your favorite newspaper with all the comfort you're used to at home or in a hotel room. When the news and *Little Orphan Annie* have been assimilated, put out the light and go to sleep.

waiting at the station, and when train-departure time arrives it will be switched into the train—gently, so as not to disturb his slumbers.

If he has elected to take the 12:50 train, our specimen business man will arrive in Washington at 7:15, but he doesn't necessarily have to be awake at that time. He can occupy the car until 8 a. m. and emerge just when business activities are beginning.

Had our hypothetical business man been bound for Baltimore rather than Washington, he would have been assigned a Baltimore car, let's say on the 12:50 train. He would arrive in Baltimore at 5:50 a. m.—much too early for anyone but a milkman to arise. However, he still has the privilege of remaining in the car until 8 a. m., and it's doubtful that he will realize when his car is dropped from the train.

This overnight sleeping-car service operates to and from some 275 points in the United States. It enables its users to arrive at their destinations spotlessly attired and with good dispositions born of a good night's rest. The traveling Pullman hotel has proved that the shortest distance between two points is a good night's sleep.

Fifty-odd years ago, when granger legislation was searching the obscure corners of business for things to regulate, a bill was introduced in the Illinois assembly to reduce the rates of the Pullman Company. In those days there were a number of competing sleeping-car companies, and many railroads operated their own sleepers. The Pullman Company, biggest in its field, was expanding fast. Both railroad men and traveling public realized the great advantage of a unified service of this sort, enabling cars to cover long routes and continuous trips without changes.

The sleeping-car bill was referred to a committee, which called on the Pullman Company at Chicago. After some preliminary fencing the chairman, in substance, said:

"One can get a bed in a good hotel for $1. [This was some 50 years ago, before the rising price levels we know today.] Why pay the Pullman Company more?"

To which Mr. Pullman replied:

"You couldn't get it for $1 if the hotel had to be moved 300 miles during the night."

After that exchange the rest of the inquiry was largely a formality. The man who popularized sleeping-car service—popularized it, it may be mentioned incidentally, not only in this country but in Europe as well—had compressed into one little sentence the whole big

Free poster stamps.

Poster stamps of the subject and in the size shown at the left, suitable for use as envelope seals, are available to readers of TRAINS free upon request. Just drop a postal card to TRAINS, 1568 W. Pierce St., Milwaukee, Wis., and we'll be glad to send you some.

Allison-Lighthall, from Chicago & North Western.

Making reservations.

Reservations for Pullman accommodations are handled at central offices, each ticket office calling in to ascertain what types of space are available. Thus there can be no mix-ups.

Pullman Company.

problem that Pullman service had undertaken to solve.

With the constant development of better things in travel, the all-Pullman train has become a true "hotel on wheels." The traveler takes excellent meals in the dining car, corresponding to the hotel's dining room; he sleeps in a bed just as comfortable as in his own home. Clean sheets, downy pillows, sleep-inviting mattresses and soft blankets put a capital *S* in sleep. Hot and cold water, plenty of towels, soap and toilet facilities are at his command. On principal trains lounge, club or observation cars are provided, putting the Pullman traveler in possession of "parlor, bedroom and bath." And his "hotel" is air-conditioned, mal ing travel a pleasure in any weather, without soot and cinders in the folds of his bedclothes in the morning.

As in a hotel, the Pullman passenger has his choice of accommodations, designed to fit any purse. The upper berth, lower berth, section, roomette, duplex single room, bedroom, compartment, and drawing room meet any requirement.

When a busy executive travels and must take his office with him, Pullman is the answer. Here, in his private room, he has his private office where he can dictate or work with perhaps greater privacy and concentration than his own office affords. Once his work is done, he can lounge around in these comfortable quarters, or turn in for a sound night's sleep. Many a "conference on wheels" has been held in a Pullman private room.

The extent of Pullman business is suggested by the statement that 40,452 passengers, on an average, slept in Pullman berths every night last year. They would have filled 100 hotels of 400 rooms each, every single night, and left a few stragglers over!

Pullman Company.

Life in a moving hotel.

A lounge car (bottom, opposite page, and top at right) is provided on most Pullman trips, furnishing the "parlor" for the "hotel guests." The atmosphere is friendly, relaxing; and one can meet interesting, congenial people. Here, too, one can read or write letters in air-conditioned comfort.

Not a moment of time need be wasted between business in one city and appointment in another. Many Pullman trains carry competent manicurists for that well-groomed appearance when you arrive. And if you had no time to get your hair trimmed, you'll find a barber on many of the trains.

Business as usual! There is no reason why conferences cannot be carried on while traveling Pullman (circle, opposite page, and center at right). Free from the distraction of their offices, many business men find they can actually accomplish more on the train than at their desks!

Did you forget your supply of smokes in your hurry to catch the train? Don't worry; cigars and cigarettes are available on almost all Pullman trains, and if you're thirsty you can usually obtain soft or mixed drinks, subject to the regulations of the state through which you're passing.

Your porter will see to it that you leave looking your very best—as spic and span as if you were leaving your own home! Your shoes were shined while you slept, and your porter (less than three per cent of whom are actually named George) is a wiz when it comes to removing stray threads.

Pullman Company.

Letters

★ Interesting sidelights on railroads as readers observe them.

Unusual Sight in Cajon Pass.

HERE is a sight seldom seen: Santa Fe engine No. 3725 (4-8-2) and Union Pacific No. 3939 (4-6-6-4), down Cajon Pass on joint UP-AT&SF line at Ono, Calif., with UP train No. 717, the *Los Angeles Challenger*. [See cut, below.] Engines of the two roads are not often used together like this. Brake-shoe smoke partially obscures the 18-car train, traveling at 50 m. p. h. on November 1, 1941.

R. H. Kindig.

3831 Perry St., Denver, Colo.

To Discontinue Service.

BECAUSE you published an article about the Pennsylvania-Reading Seashore Lines in the August issue (which was excellent), I am sending some information concerning this road: On February 17, 1942, all passenger service will be discontinued on the Pennsgrove, Salem and Bridgeton branches. This means that 39 South Jersey communities will be without railroad passenger service.

Donald Wentzel.

320 N. 7th St., Millville, N. J.

. . . Freight service will be continued. . . . Incidentally, the Alloway and Quinton spur of the Salem Branch (see your map, August issue) has been abandoned since September 1, 1940, when all bridges and stations were washed out in a flood.

Edward H. Bilderback.

5 Marlton St., Woodstown, N. J.

How Time Flies!

TRAINS for January gives the year as 1941. It appears on page 3. The cover gives no year, and nowhere in the magazine does the date 1942 appear. You might like to change the year for your February number. This issue dated 1941 is going to cause confusion in the files some people keep. It shows how history gets written wrong sometimes: Somebody might quote this issue and date the reference as 1941.

Proofreading is an important part of magazine and book publishing, but is getting worse with some publishers year by year.

Anonymous.

Chicago.

[Our face was already red when your letter arrived, Mr. Anonymous. We'll agree that proofreading *does* seem to be getting worse the country over; however, we've tried to keep ours above standard by giving each page two complete readings by different proofreaders and a third reading to check corrections made in the first two readings. Even so, mistakes sometimes occur, though usually not of such a blatant nature. Your point about future references is a good one, and we would suggest that *all* readers rectify the error *now* by changing the date in their respective copies.—*Ed.*]

Finds Ghost Railroads.

UP IN Maine (or down in Maine, depending upon whether or not you are a New Englander) I "discovered" a couple of abandoned roads and it was not until I consulted an old atlas that I learned their names. One was the RF&RL, which must have stood for Rumford Falls & Rangeley Lake. It ran from Rumford Falls (now Rumford) to Bemis, Me., on the east shore of Lake Mooselookmeguntic, and must later have been extended to Mountainview. The present auto road utilizes this abandoned roadbed for

R. H. Kindig.

some miles south of the town. I don't know when the rails were torn up, but it must have been when the resort business took a nose-dive.

The other road seems to have been the Phillips & Rangeley Railroad. The remaining vestiges are some old open-end coaches along the highway between Phillips and Rangeley Lake. They are much too weatherbeaten to disclose any legible lettering, so I cannot be positive in identifying the line.

There is another road up in Maine which might be the basis of an interesting article for TRAINS. It runs between Belfast and Burnham Junction, and thus connects Belfast with the main line of the Maine Central. I have seen the road and rolling stock but the information is hearsay. But here goes anyhow: The story is that the line was originally owned by the MC but was slated for abandonment because of lack of revenue. Instead of allowng abandonment the city of Belfast purchased the road and runs it as a city-owned railroad, the only city-owned railroad in the country, I understand. I do not have the means to verify this story but if it be true it is interesting, to say the least.

William H. Hunt.

River Rd., Youngstown, N. Y.

[We know of several municipally-owned railroads in the country, and doubtless there are many more. Closest to home is a six-mile electrified line between Mukwonago and East Troy, Wis., which was purchased by East Troy from the Milwaukee Electric Lines in the late thirties, upon recession of the East Troy line to Hales Corners. After purchasing the right of way, East Troy leased the line to the original owners, thereby keeping freight connection with the Soo Line at Mukwonago. Relieved of taxes on the right of way, Milwaukee Electric Lines can operate the stretch at a profit.—*Ed.*]

RIO GRANDE SOUTHERN PHOTOGRAPHS

TRAINS readers desiring photographs of steam operations along this narrow gauge mountain railroad may obtain a set of eight 5" x 7" glossy prints, each of which shows a steam freight train at a different point along the main line and which, together, present a rather complete panorama of Rio Grande Southern. The complete set of eight will be mailed to you postpaid for one dollar.

Send one dollar in cash, money order, or check to

William Moedinger Jr.
23 E. Vine St. Lancaster, Pa.

YOU CAN HAVE THE RAILROADS AT YOUR FINGERTIPS

All important railroad routes are easily followed on this map, and the three-dimensional relief makes it easy to see what determined the routing, how mountains are crossed and river valleys followed. It's almost as much fun to follow your favorite trains on this map as it is to actually ride them!

★ What formerly was only an appeal to the imagination is now made a reality by this out-of-the-ordinary map. It shows at a glance how our country grew; how rivers, the easiest and earliest means of travel, decided the flow of population inland; how rugged mountains stopped population's spread; how terrain in the early days presented difficult transportation problems, shaped the distribution areas which still exist today, and why certain sections were so important to the future development of our original thirteen states.

★ The Professional and Business Man will find in this map, the missing link, the portrayal of the third dimension, HEIGHT, which opens new realms of comprehension and interest.

★ The utmost thought has been given to the making of this, the *ne plus ultra* of maps . . . the most educational, practical and most beautiful ever produced. Indeed, this is the "Masterpiece of the Map-Makers' Art."

★ This unique map is the creation of Theo. W. Ohman, whose work has been acclaimed by leaders of industries, educators, and other renowned Map-Makers. He has spent many years in the development of an original process for making fine detail relief maps (actually raised), and later, through his own method, created this lithographed reproduction which appears to be actually raised. The Ohman family have been map-makers for many generations.

Map is 36" x 23", scale 1" to 85 miles. Key to the map is on reverse side, and each copy is complete with metal strips for hanging.
Postpaid **$3.50**

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The Month

★ New fleet of C&NW streamliners blitzes schedules.

★ At one fell swoop the Chicago & North Western has inaugurated 15 new streamlined passenger trains, a blitzkrieg without precedent in the passenger business. This involves a wholesale revision of schedules north and northwest of Chicago, and while many of the trains are short-run, the daily mileage of each equipment unit is kept high by rotation of the trains among various runs. For instance, one train starts in Milwaukee, goes to Chicago, and then makes a round trip to Green Bay, while another starts in Chicago and makes an odd number of Chicago-Milwaukee trips, ending in Milwaukee. By effective utilization of equipment all 15 trains are handled with five five-car streamliners, four powered by Diesel and one by a streamlined Pacific. The name "400" is used on all trains, in connection with a route or destination adjective.

★ The Milwaukee Road and Rock Island Lines plan jointly to build a $1,500,000 bridge across the Missouri River for direct east and west entrance into Kansas City. The matter is now before the I. C. C.

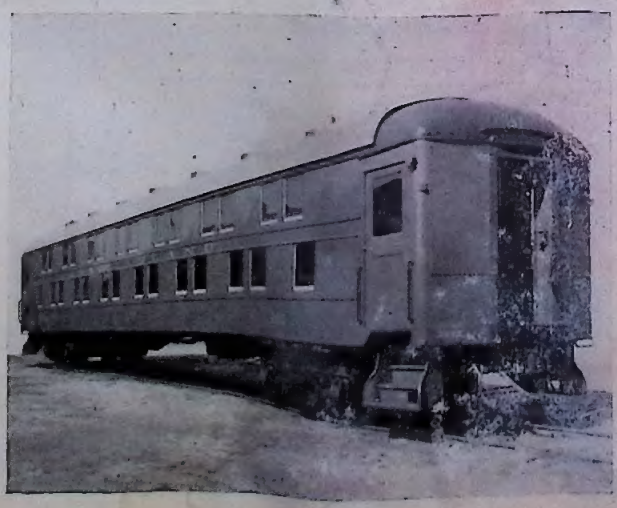
★ The Illinois Central has asked to abandon its Dodgeville, Wis., branch, 57.4 miles of railroad which has long been a favorite with Midwestern railroad connoisseurs because of the scenic route as well as the special interest of the railroad itself.

★ New luxuries in coach travel have been gradually eclipsing the parlor car. Two pieces of news spotlight the trend. The makeup of the new *Empire State Express* has a tavern-lounge car at the head end, then the parlor cars, then a diner, then some coaches, another diner, more coaches, and an observation-lounge car on the rear for the use of coach passengers! Two roads, Norfolk & Western a year ago, and Missouri Pacific now, have purchased 24 and 20 used parlor cars from the Pullman Company for conversion into coaches. The Victorian elegance of the old-time parlor car seems to have given way almost entirely to the smooth comfort of the coach for day travel and to the overnight efficiency of the Pullman sleeper for the first-class trade.

★ The New York Central, in deciding to put new equipment on the *Empire State Express*, studied the economics of new passenger trains more thoroughly than had ever been done before, and the very scientific procedure is reported in detail in the December 20 *Railway Age*. One basic thought to notice is that since the depreciation and amortization of new equipment is on an annual basis, and since earnings of a train are on a per-mile basis, a new train must be able to make a high daily mileage to pay for itself. That explains why new equipment can't be assigned to many an isolated, but short, branch even though the patronage for one or two runs might be high. Each train of the *Empire State* makes 654 miles daily, or 477,621 miles per year, and on this basis the NYC figures it will take 51.8 cents per mile additional gross earnings to justify the new equipment. Twenty-nine new coach or 17 new parlor car passengers will do this, but they must be new passengers, not passengers snared from other NYC trains. To ascertain if the new trains really do this a very detailed analysis of ticket sales is being made. It is unfortunate that the war and the ban on tires will probably throw out of line this first really efficient study of the value of new passenger trains.

★ The Pennsylvania Railroad is reported by *Railway Age* as inquiring for the Diesel-electric passenger locomotive of 4000 horsepower. The Pennsy has heretofore put its money in electrics for the Eastern heavy traffic area and steam for the balance of its lines.

★ The Santa Fe is placing in service on *El Capitan* an entirely new type of passenger car, deeply sprung and suspended like a pendulum from a point two feet above the center of gravity. Thus the car leans inward on curves, adding to the banking effect of the track.

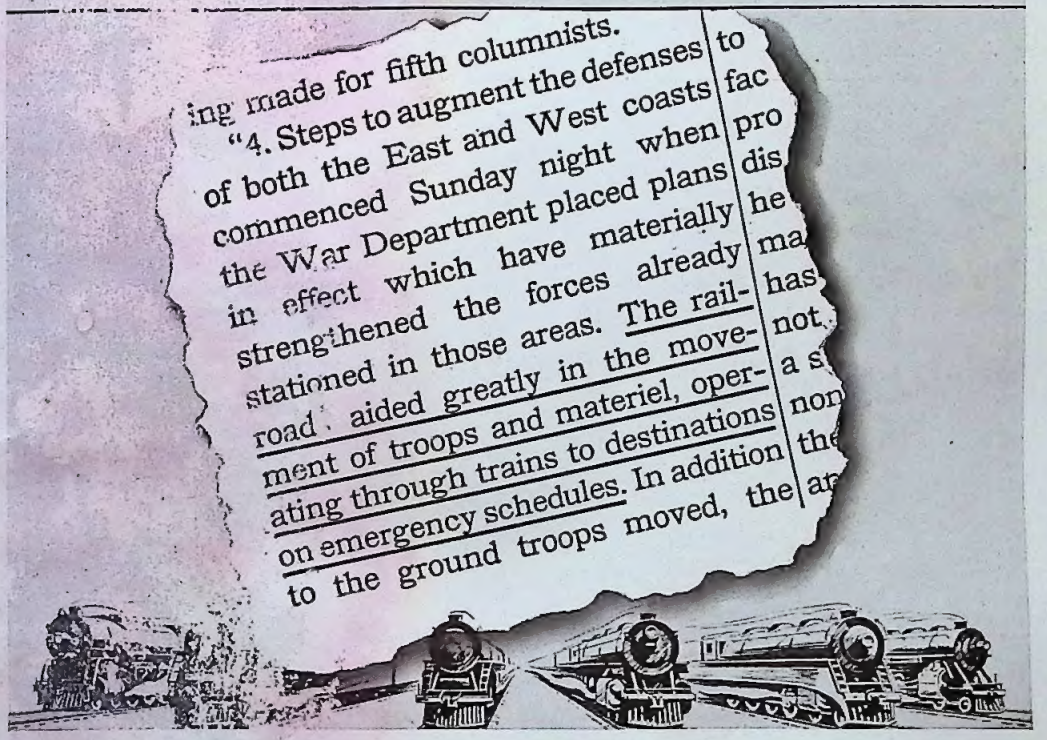


Double-decker.

This is the experimental double-deck suburban coach put into service by the Long Island Railroad 10 years ago. Now the road has ordered 10 more, half motor cars seating 134 passengers and half trailers seating 130. The seating capacity of an ordinary suburban coach is around 80 people.

December 10, 1941

WAR DEPARTMENT COMMUNIQUE NO. 2



"The Railroads aided greatly"...

...and are proud to do their part in carrying out plans made long before, between railroads and the military departments of the government.

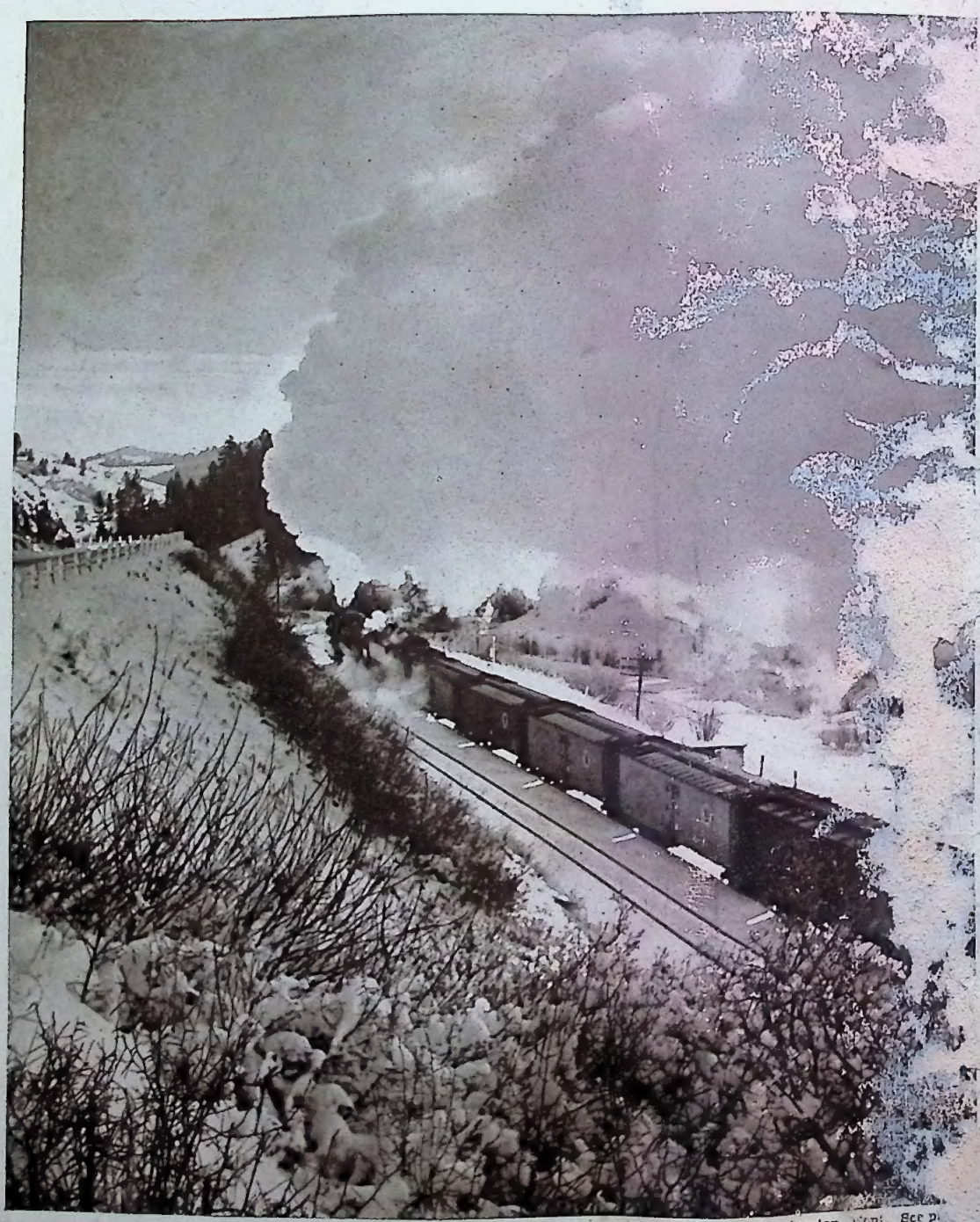
The years of planning and preparation proved their worth when war struck—suddenly and treacherously—on December 7, 1941.

A united, determined America can count on its fighting forces—and its railroads!

ASSOCIATION OF AMERICAN RAILROADS

★ ★ ★ ★ ★ ★ ★ WASHINGTON, D. C. ★ ★ ★ ★ ★ ★ ★

Trains



E. R. Augustin Jr., Livingston, Mont. See p